THE WORLD OF LAPP

Industrial Data Communication

LAPP

legend

INDUSTRIES

- Automation
- e-Mobility
- Food & Beverage
- Mechanical and Plant Engineering
- Oil & Gas
- Rail
- Solar Energy
- Wind Energy

PRODUCT CHARACTERISTICS

- Suitable for outdoor use
- Good chemical resistance
- Flame-retardant
- Wide clamping range
- Halogen-free
- Heat-resistant
- Cold-resistant
- Corrosion-resistant
- Maximum vibration protection
- Mechanical resistance
- Assembly time
- Low weight
- Oil-resistant
- Optimum strain relief
- Space requirement
- Power chain
- Clean room
- Robust
- Acid-resistant
- Reliability
- Integrated SKINTOP® cable gland
- Voltage
- Connector with standard housing unit
- Interference signals
- Temperature-resistant
- Torsion-resistant
- Torsion load
- UV-resistant
- Waterproof
- Variety of approval certifications

Please note:
The purpose of the icons is to provide you with a quick overview and a rough indication of the product features to which the corresponding information relates. You can find details of product characteristics in the “technical data” sections on the product pages.

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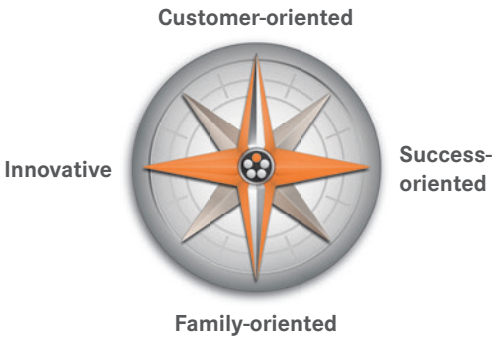
Andreas Lapp,
Matthias Lapp,
Ursula Ida Lapp,
Alexander Lapp,
Siegbert Lapp.

family

On course for success



Family business and global player

LAPP is both. The history of our company has been one of success and expansion ever since it was founded in 1959 by Ursula Ida and Oskar Lapp. It remains resolutely family owned to this day. We safeguard our success by staying close to our customers and markets, maintaining our innovative strength and brand quality, and being a reliable partner. We provide continuity, always guided in our thoughts and actions by our values.

Success built on family values

At LAPP, we maintain values that promote cooperation and enable relationships with employees, suppliers and customers based on partnership and trust. Good relations and mutual respect are key elements of our company culture and a central plank of company policy. We know that our successful business development of the last decades is down in particular to our 3,770 skilled and dedicated staff around the world, as well as the reliable partnership with our customers.

With 17 production facilities, over 40 sales companies and hundreds of dedicated consultants, we are always close to the individual needs and challenges of our customers all over the globe. We are constantly developing our products and system solutions, setting standards in safety, quality and functionality. This is why we are one of the world's leading manufacturers of integrated solutions and branded products in cable and connection technology. As our success story enters its third generation, we are aware of our duty to the future.

www.lappkabel.com/company

8 brands

Uncompromising quality – worldwide

ÖLFLEX®
Power and control cables

ÖLFLEX® has become synonymous with power and control cables. Our flexible and oil-resistant cables satisfy the highest demands and can withstand even the very toughest conditions.

UNITRONIC®
Data communication systems

Our high-quality UNITRONIC® data network cables and field bus components provide a forward-looking solution for all applications in industrial machinery and plant engineering. From transmission of simple control signals to field bus signals in complex network structures – we offer a dependable cabling and connection solution for almost every situation.

ETHERLINE®
Data communication systems for ETHERNET technology

Our ETHERLINE® branded products open up a secure, fast and reliable path to the future of Ethernet applications, e. g. PROFINET®. The systems are made up of durable and robust cables and connection components for passive and active network technology, and deliver an effective solution for almost any application, particularly in an industrial environment.

HITRONIC®
Optical transmission systems

HITRONIC® fibre optic cables make transmitting large data volumes easy: fault free, bug proof and at almost light speed. Even electromagnetic radiation does not interfere with the transmission. The HITRONIC® range includes the ideal solution for indoor or outdoor use, for demanding conditions, and even for use in power chains.

EPIC®
Industrial connectors

EPIC® industrial connectors can be found everywhere in industrial machinery and plant engineering, for measuring, control and drives. EPIC® is a flexible system of housings, inserts and contacts: all extremely robust, absolutely safe and simplicity itself to assemble.

SKINTOP®
Cable glands

Simply feed in the cable and twist. That's it. Our SKINTOP® cable glands provide secure connections in no time. The universal systems are simple but effective. They secure and centre the cable, hermetically seal it and guarantee optimum strain relief.

SILVYN®
Protective cable conduit systems and cable carrier systems

The universal range of SILVYN® protection and guidance systems protect cables effectively against dust, moisture, mechanical, thermal and chemical influences. The versatile SILVYN® CHAIN range of energy supply chains also protects and guides cables in dynamic applications.

FLEXIMARK®
Marking systems

The requirement: permanent marking. The solution: FLEXIMARK®. These sophisticated systems mean that a clear overview inside a control cabinet is no longer just a pipe dream. From simple labels for manual marking through to electronic markings, the FLEXIMARK® range is guaranteed to be permanent.

Industrial Data Communication by LAPP.

The right solution for every application

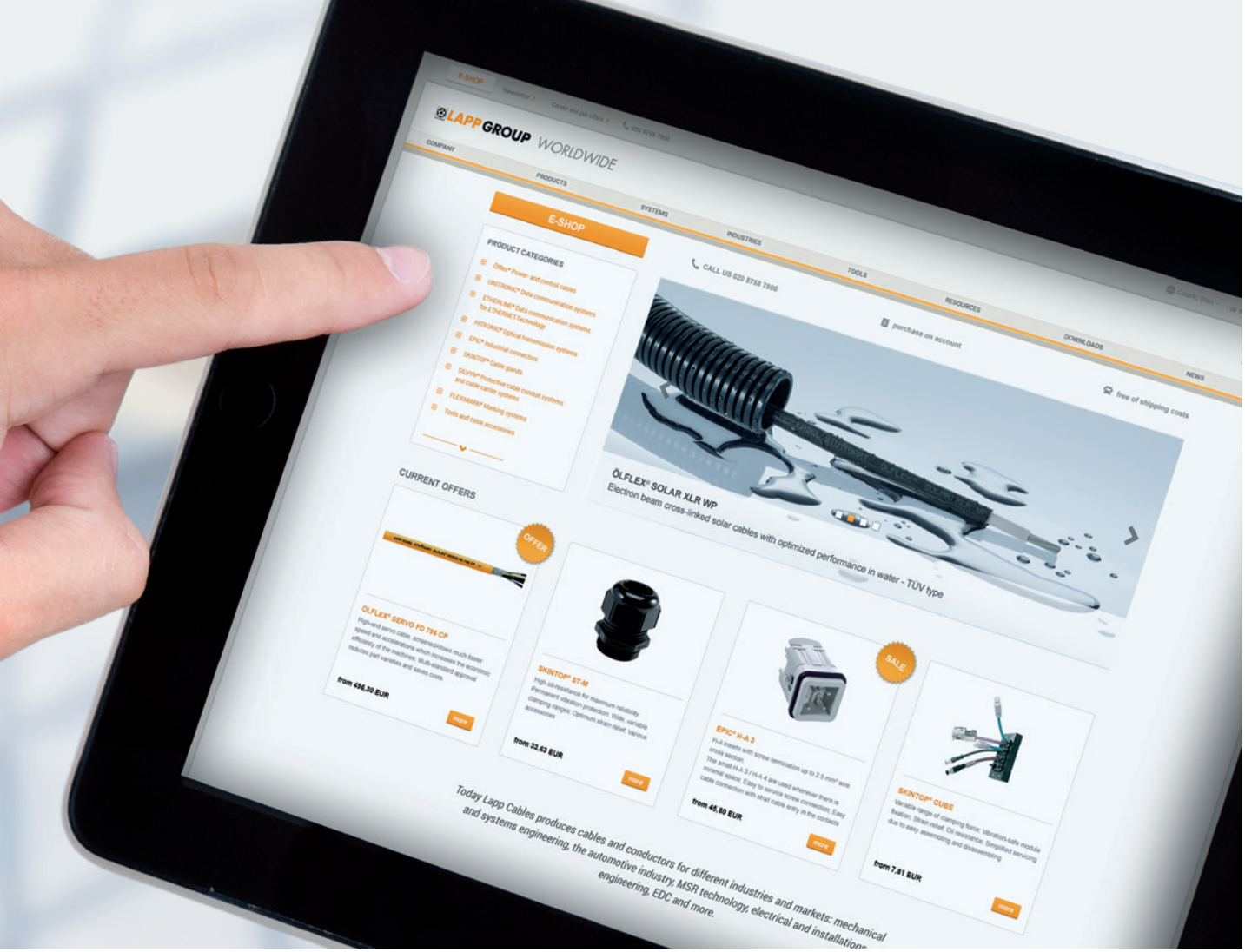
Digitalisation is already leading to ever increasing data volumes in production halls. As a result, Ethernet, which has already become a standard in office environments, is also becoming increasingly important in industrial environments. The challenge for industrial data cables lies in reliably transferring ever higher data rates in harsh industrial environments. The cables are often bent millions of times in cable chains or are exposed to corrosive substances and high temperatures.

As we incorporate products into our customers' automation processes, we are constantly asked to supply innovative ideas to solve important future-oriented challenges. Therefore we offer our customers a wide array of components and system solutions for factory, building and process automation. Our data communication solutions include complete cabling and connectivity systems for integrated networking at the sensor/actuator and control level right through to the inventory management system.

www.lappkabel.com/idc-experience

YOUR BENEFITS

- Extremely high availability of materials
- Approx. 800 cable types for Ethernet and Fieldbus
- Approx. 150 different data connectors
- Switches and distribution boxes available in various designs
- Products for all protocol standards
- Protocol-independent expert know-how
- No MOQ on stocked articles
- Cables, patchcords or customer-specific assemblies
- Global availability at 40+ sites



Product finder – don’t search, find it!

Productfinder

With eight brands and more than 40,000 items, providing the perfect cables, connectors and related components. With our intelligent product finder, you can find what you’re looking for right away.

www.lappgroup.com/productfinder

Assembly finder

Use smart filters to quickly create your data cable assembly.

www.lappgroup.com/assemblyfinder

Cable Marking Finder

Our **FLEXIMARK**® cable marking finder helps you create your required marking or labelling in next to no time.

www.lappgroup.com/markingfinder

Cable protection finder

With our **SILVYN**® cable protection finder, you can choose the required cable protection and matching accessories with just a few clicks.

www.lappkabel.com/cable-protection-finder

Connector Housing Configurator

Configure your own individual industrial connector housing with locking concept and cable entries.

www.lappgroup.com/connector-housing

Cable Finder

The right cable in seconds.

www.lappgroup.com/cablefinder

ÖLFLEX® CONNECT CHAIN Configurator

Configure your individual **ÖLFLEX® CONNECT** CHAIN here online incl. all media (cables, hoses).

Optimized for tablet

www.lappkabel.com/chainconfigurator

Servo Configurator

Simply select the application and cable length to find your servo assembly in seconds.

www.lappgroup.com/servoconfigurator

Charging Cable Configurator

Use the charging cable configurator to configure the right charging cable and connector in no time at all.

www.lappgroup.com/emobility-cablefinder

Connector Finder

Design, insert, housing and counterpart – the right connector in just a few clicks.

www.lappgroup.com/connectorfinder

Cable Gland Finder

Use the **SKINTOP®** Finder to help you identify the cable gland you need and the required accessories.

www.lappgroup.com/cable-glandfinder

Spiral Cable Configurator

Determine the block and extension length for your spiral cable with just a few clicks.

www.lappkabel.com/spiralconfigurator

product finder

fast connect

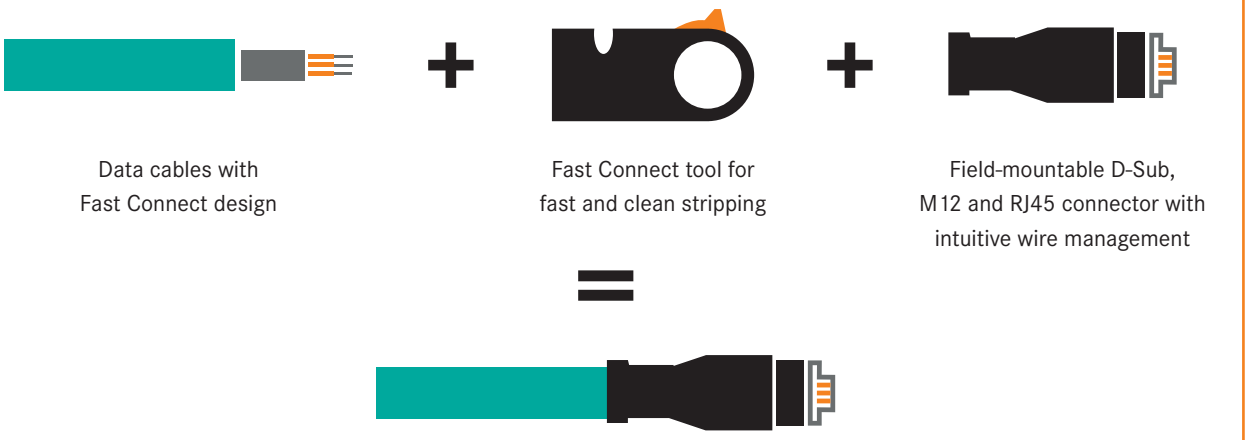
Up to 50 % time saving in data connector assembly

Our Fast Connect system for PROFINET® and PROFIBUS®.
Industrial production and manufacturing environments require ever larger data volumes to be processed as quickly as possible. As a result, the demands on cabling also increase. This is because the products utilised must not only be designed for steadily growing data rates in the gigabyte range, but also be robust enough to ensure the reliability and operational safety of machines and systems.

The solution from LAPP
Our range of innovative Fast Connect data cables feature a special inner sheath and a cross separator instead of pair screening (Cat.6_A). This special cable design reduces assembly time by up to 50 %, while perfectly fulfilling all of the requirements for the shielding and application. Furthermore, there is no need to painstakingly remove the pair screening four times on Cat.6_A cables, as it is now possible to strip right down to the wire pairs using the right tool.

You can find our Fast Connect system for PROFIBUS® on page 22 and for PROFINET® on page 118.

Perfectly compatible – Our Fast Connect components for Ethernet and fieldbus standards



YOUR BENEFITS

- Up to 50 % time saving in assembly
- Perfect processing of EMC screening
- Specially coordinated components
- For Ethernet and fieldbus standards
- UL approval for the US market

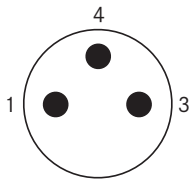
How-to video

The step-by-step instruction video can be found here.

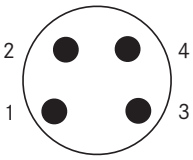
www.lappkabel.de/HowtoRJ45EN

Pin assignments

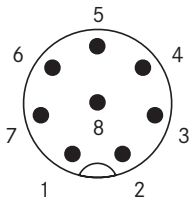
M8 pin assignments (IEC 61076-2-104)



3-pos.
A-coded for
Sensor/actuator
cabling

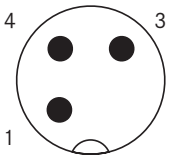


4-pos.
A-coded for
Sensor/actuator
cabling and
Industrial Ethernet

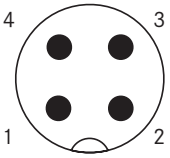


8-pos.
A-coded for
Sensor/actuator
cabling

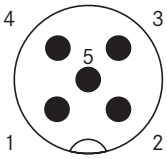
M12 pin assignments



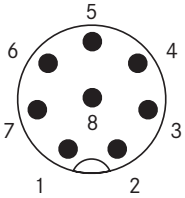
3-pos.
A-coded for
Sensor/actuator
cabling



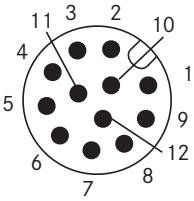
4-pos.
A-coded for
Sensor/actuator
cabling



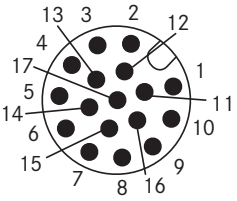
5-pos.
A-coded for
Sensor/actuator
cabling



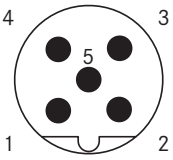
8-pos.
A-coded for
Sensor/actuator
cabling



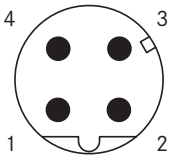
12-pos.
A-coded for
Sensor/actuator
cabling



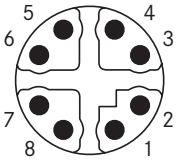
17-pos.
A-coded for
Sensor/actuator
cabling



5-pos.
B-coded for
PROFIBUS®

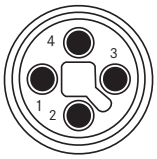


4-pos.
D-coded
for Industrial
Ethernet



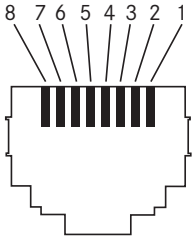
8-pos.
X-coded
for Industrial
Ethernet

3+PE-pos.
S-coded
for power
supply



4-pos.
T-coded
for power
supply

RJ45 pin assignment (IEC 60603-7)



Connector pin assignments

TIA 568-A	TIA 568-B	PROFINET®	RJ45	M12 D-coded	M12 X-coded	M8
White/Green	White/Orange	Yellow	1	1	1	1
Green	Orange	Orange	2	3	2	4
White/Orange	White/Green	White	3	2	3	2
Blue	Blue		4		8	
White/Blue	White/Blue		5		7	
Orange	Green	Blue	6	4	4	3
White/Brown	White/Brown		7		5	
Brown	Brown		8		6	

UNITRONIC®

Data communication systems

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Application areas for bus cables

- Plant engineering and construction
- Factory Automation (field busses like AS-Interface, PROFIBUS®, INTERBUS®, DeviceNet™, CAN etc.)
- Process Automation (chemical, petro-chemical industry etc.)
- Building Automation (building management)

Overview of the most common bus systems

AS-Interface (AS-I)
Developed to have an inexpensive alternative on the lower Fieldbus level (sensor/actuator) of Automation. Used very often in connection with Ethernet, PROFIBUS®, CAN and DeviceNet™.

PROFIBUS®
We distinguish between PROFIBUS® DP and PROFIBUS® PA. The DP variant dominates worldwide with a bit rate of 1.5 Mbit/s up to 12 Mbit/s PROFIBUS® PA is the leader in Process Automation in Europe.

CAN/CANopen®
Originally developed for cars. Used in industry in an extremely broad range of applications.

DeviceNet™
Prior Fieldbussystem in North America. Developed by Allen Bradley (Rockwell Automation). Based on CAN.

Fieldbus Foundation™
Bus system for use in Process Automation.

SafetyBUS
Bus systems are developed especially for safety-relevant areas. They operate either completely independently (e.g: SaftyBUS p®) or are part of an overall system (e.g. PROFIsafe, INTERBUS® Safety, DeviceNet™ Saftey etc.).

INTERBUS®
One of the first field bus systems used in the automotive industry.

European Installation Bus EIB/KNX®
Bus system for Building Automation. Operates primarily with low bit rate.

Other bus systems
For dedicated bus systems or modified system solutions based on standardized systems.

CAN = Controller Area Network
DeviceNet™ = registered trademark of Open Device Vendors Association (ODVA)
Fieldbus Foundation™ = registered trademark of Fieldbus Foundation™

SafetyBUS p® = registered trademark of Pilz GmbH & Co. KG
INTERBUS® = registered trademark of Phoenix Contact GmbH & Co
Lapp Kabel is a member of the PROFIBUS® user organisation e. V. (PNO)

Type designations for UNITRONIC® SENSOR

S/A cables e.g. item no. 22260339

Connection on left	Cable	Connection on right

AB- C4- M12MS- 2.0PUR- M12FA-2L

- Automation Bus
- Cordset
- Number of pins (**4**)
- Connector/thread (**M12**)
- Connector/design (**straight connector**)
- Cable length in m (**2.0 m**)
- Cable material – outer sheath (**PUR**)
- Connector/thread (**M12**)
- Connector/design (**angled socket**)
- Status display/number of LEDs (**2L**)

MS – straight connector
MA – angled connector
FS – straight socket
FA – angled socket
M8, M12, M16, M23 – thread
L – status display/LEDs
SH – screened version
HD – Hygienic Design
VA – stainless steel knurl
M12Y – M12 Y connector
B – bridged
3-, 4-, 5-, 8-, .. number of pins
A, AD, B, BI, C, CI – valve connector type
S – valve connector with Z diode
SV – valve connector with varistor
SVC – valve connector with varistor and commutator
SUP – valve connector with suppressor diode

mountable connector e.g. item no. 22260127

AB- C5- M12FS-PG7-SH

- Automation Bus
- Connector
- Number of pins (**5**)
- Connector/thread (**M12**)
- Connector/design (**straight connector**)
- Cable connection/screw connection (**PG7**)
- Screened version (**SH**)

MS – straight connector
MA – angled connector
FS – straight socket
FA – angled socket
P – piercing connection
SH – screened version
M8, M12, M16, M23 – thread
3-, 4-, 5-, 8-, .. number of pins
PG7, PG9, PG11, PG13 – cable connection
F0.34 (fast connection, max. 0.34 mm² cond. cross-sec.)
F0.75 (fast connection, max. 0.75 mm² cond. cross-sec.)
M16-0.5 (M16 flush-type conn. with 0.5 m PUR strand)
PG9-0.5 (PG9 flush-type conn. with 0.5 m PUR strand)
DSI – flush-type connector (rear wall mounting)
PO – flush-type connector (can be positioned)

S/A passive distributor box e.g. item no. 22260025

AB- B8-M12L-16-10.0PUR

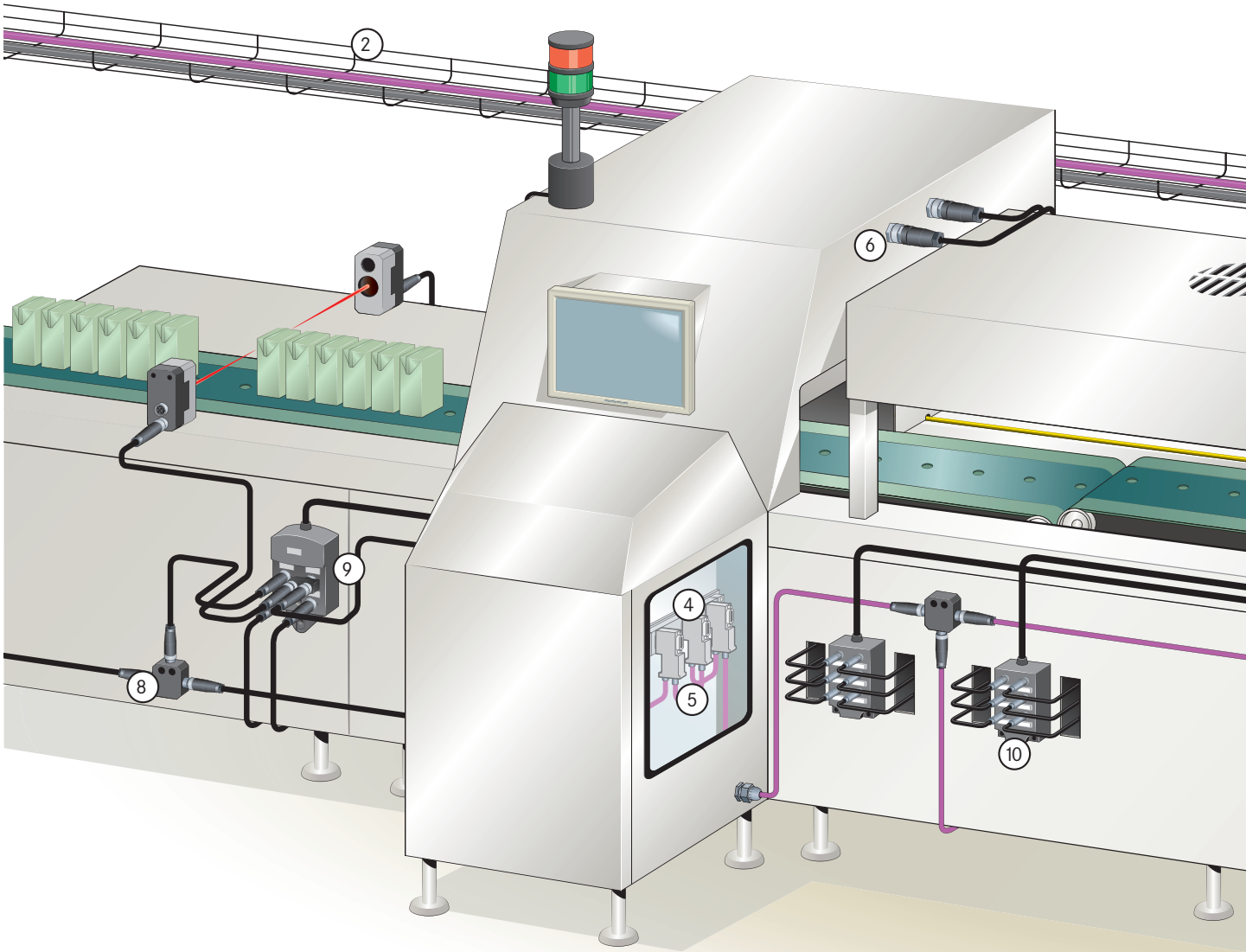
- Automation Bus
- Box
- Number of slots (**8**)
- S/A connection/thread (**M12**)
- Status display/LED signals (**L**)
- Number of inputs/outputs (**16**)
- Length of master cable in m (**10.0**)
- Cable material – outer sheath (**PUR**)

INFO: S/A box with **double** assignment → $\frac{\text{(number of inputs/outputs)}}{\text{(number of slots)}} = 2$

PUR – distributor box with perm. connected master cable (PUR)
C – distributor box with master cable conn. (pluggable screw connection)
M8L – distributor box with M8 slots and LED signals
M16 – distributor box with M16 master cable conn.
M12 – distributor box with M12 master cable conn.

Further abbreviations:

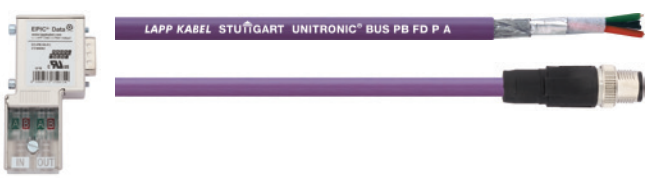
AB-PC – Automation Bus Power Cable
AB-PB – Automation Bus PROFIBUS®
AB-DN – Automation Bus DeviceNet™
AB-ASI – Automation Bus AS-Interface
AB-ASI-J – AS-Interface distributor



Data communication systems Overview

Bus systems

Page 44 to page 95

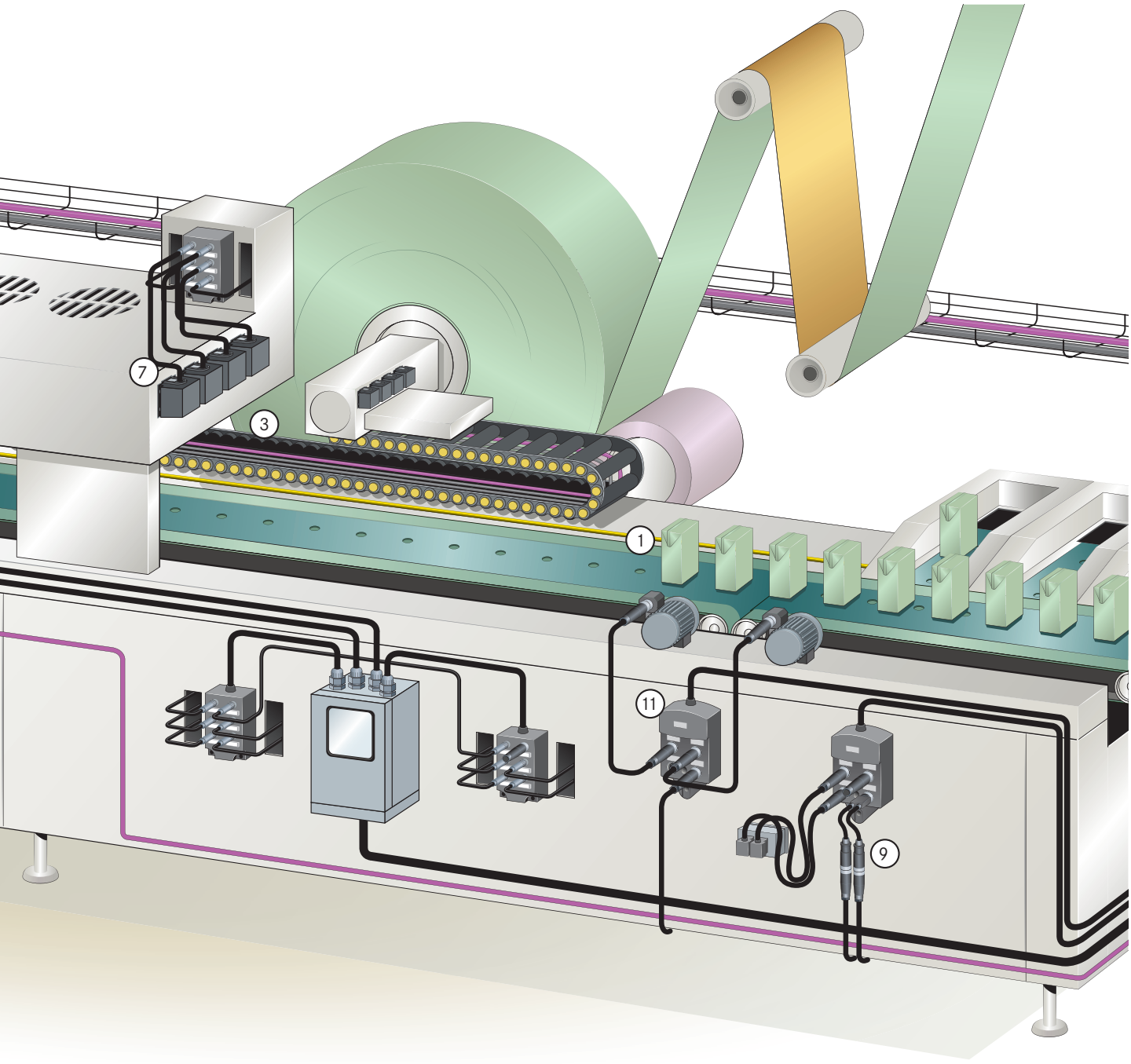


Support of all major fieldbus systems, among others PROFIBUS® (DP and PA), CAN, DeviceNet™, CC-Link®, AS-Interface, ISOBUS, Foundation Fieldbus™, KNX®. Cables for in- and outdoor, extreme temperatures, fixed/flexible installation and high flexible application. M12- and Sub-D connectors, cordsets and accessories.

Sensor/actuator cabling

Page 96 to page 112

The complete range of M8-, M12- and valve connectors, cables, cordsets, matching distribution boxes and accessories. Available as shielded/unshielded version, optional LEDs, with different cable materials and connection technologies.



1. AS-interface cables from page 46
2. PROFIBUS® cables (fixed installation) from page 48
3. PROFIBUS® cables (highly flexible) from page 59
4. PROFIBUS® Sub-D connector from page 67
5. PROFIBUS® M12 cordsets from page 72
6. Sensor/actuator M12 connector from page 103
7. Valve connectors from page 41
8. Sensor/actuator T distributor, page 107
9. Sensor/actuator Y distributor from page 39
10. Sensor/actuator M8 distribution boxes, page 109
11. Sensor/actuator M12 distribution boxes, page 110

Quickfinder Bus cables

Bus system	Inst. area	Application/cabling	Outer sheath material	Approval
PROFIBUS® DP (150 Ω)	indoor (UV = outdoor)	static	PVC	
				UL/CSA (CMX)
				UL/CSA (CMG)
				UL/CSA (PLTC-ER)
			H	UL/CSA (CM)
				UL/CSA (CMG)
			PUR	UL/CSA (CMX)
			ROBUST	
			PE	
			TPE	
			FEP	
		static/flexible	PVC	UL/CSA (CMG)
				UL/CSA (CMG)
			H	
		high flexible	PUR	
				UL/CSA (CMX)
				UL/CSA (CMX)
			PVC	UL/CSA (CMG)
			FRNC	UL/CSA (CMG)
		torsion	PUR	UL/CSA (CMX)
		festoon	PVC	UL/CSA (CMG)
	outdoor & burial	static	PVC	
			PVC/PE	
PROFIBUS® PA (100 Ω)	indoor	static	PVC	
	indoor/outdoor	static	PVC	
				UL/CSA (CMG)
CAN CANopen® (120 Ω)	indoor	static	PVC	UL/CSA (CMX)
		static/flexible	PVC	UL/CSA (PLTC-ER)
		high flexible	PUR	UL/CSA (CMX)
	outdoor	static	PVC/PE	
DeviceNet™ (120 Ω)	indoor (UV = outdoor)	static	FRNC	UL/CSA (CMG) Germ. Lloyd
			PVC	UL/CSA (CMG)

Legend

*second outer sheath need to be removed before harnessing
**Standard Sub-D plug 9-pin
Please see detailed technical information on the data sheet (www.lappgroup.com/products)

7-W: 7-Wire: 7-stranded litz, dedicatet for vibrating machine parts
CAN: Controller Area Network
FC: **F**ast **C**onnect (cable construction for fast connector harnessing)
FD: high flexible (german – “Flexible Dauerbiegung”)
FRNC: Flame Retardant Not Corrosive

Characteristics	Article designation	Article number	Page
	UNITRONIC® BUS PB	2170220	48
	UNITRONIC® BUS PB A	2170219	48
Fast **C**onnect, UV-resistant	UNITRONIC® BUS PB FC	2170820	48
105 °C temperature resistant	UNITRONIC® BUS PB 105	2170630	51
PLTC-ER approval for cable trays	UNITRONIC® BUS PB TRAY	2170856	49
Fast **C**onnect, halogen-free	UNITRONIC® BUS PB H FC	2170326	48
Fast **C**onnect, halogen-free, flame retardant	UNITRONIC® BUS PB FRNC FC	2170853	53
Fast **C**onnect, oil resistant	UNITRONIC® BUS PB P FC	2170330	48
higher chemical resistance, UV-resistant	UNITRONIC® BUS PB ROBUST	2170620	50
Fast **C**onnect, food & beverage industry, black, UV-resistant	UNITRONIC® BUS PB PE FC	2170333	48
food & beverage industry, black, UV-resistant	UNITRONIC® BUS PB PE	2170233	48
105 °C; temporary up to 120 °C	UNITRONIC® BUS PB 105 plus	2170635	51
180 °C heat resistant, -50 °C cold resistant	UNITRONIC® BUS PB HEAT 180	3031981	52
vibration resistant, UV-resistant	UNITRONIC® BUS PB 7-W A	2170824	48
Fast **C**onnect, vibration resistant, UV-resistant, black	UNITRONIC® BUS PB Y 7-W FC BK	2170310	58
Fast **C**onnect, vibration resistant, UV-resistant	UNITRONIC® BUS PB 7-W FC	2170826	48
vibration resistant, COMBI 3 x 1 mm²	UNITRONIC® BUS PB COMBI 7-W	2170225	48
vibration resistant, halogen-free	UNITRONIC® BUS PB H 7-W	2170226	48
drag chain suitable, halogen-free, oil resistant	UNITRONIC® BUS PB FD P	2170222	59
drag chain suitable, halogen-free, oil resistant	UNITRONIC® BUS PB FD P A	2170822	60
Fast **C**onnect, drag chain suitable, oil resistant	UNITRONIC® BUS PB FD P FC	2170322	61
drag chain suitable, oil resistant, COMBI 3 x 1 mm²	UNITRONIC® BUS PB FD P COMBI	2170227	63
drag chain suitable, oil resistant, COMBI 4 x 1.5 mm²	UNITRONIC® BUS PB FD P HYBRID	2170495	63
drag chain suitable, oil resistant, UV-resistant, COMBI 4 x 1.5 mm²	UNITRONIC® BUS PB FD Y HYBRID	2170875	64
Fast **C**onnect, drag chain suitable, halogen-free, flame retardant	UNITRONIC® BUS PB FD FRNC FC	2170854	62
torsion, halogen-free	UNITRONIC® BUS PB TORSION	2170332	65
cable trolley, festoon, UV-resistant	UNITRONIC® BUS PB FESTOON	2170331	66
UV-resistant, armoured, max. EMV-protection	UNITRONIC® BUS PB ARM	2170247	54
UV-resistant, burial, black	UNITRONIC® BUS PB Yv	2170223	55
UV-resistant, burial, black	UNITRONIC® BUS PB YY	2170236*	56
Fast **C**onnect, UV-resistant, burial, black	UNITRONIC® BUS PB BURIAL FC	2170323*	57
Ex area, blue	UNITRONIC® BUS PA BU	2170234	75
UV-resistant, black	UNITRONIC® BUS PA BK	2170235	75
Fast **C**onnect, Ex area, oil resistant, UV-resistant, blue	UNITRONIC® BUS PA FC (BU)	2170334	75
Fast **C**onnect, oil resistant, UV-resistant, black	UNITRONIC® BUS PA FC (BK)	2170335	75
vibration resistant	UNITRONIC® BUS CAN 1x2x0.22	2170260	78
	UNITRONIC® BUS CAN 2x2x0.22	2170261	78
	UNITRONIC® BUS CAN 1x2x0.34	2170263	78
	UNITRONIC® BUS CAN 2x2x0.34	2170264	78
	UNITRONIC® BUS CAN 1x2x0.5	2170266	78
	UNITRONIC® BUS CAN 2x2x0.5	2170267	78
	UNITRONIC® BUS CAN 1x2x0.75	2170269	78
	UNITRONIC® BUS CAN 2x2x0.75	2170270	78
PLTC-ER approval for cable tray	UNITRONIC® BUS CAN TRAY 2x2x0.34	2170857	79
drag chain suitable, oil resistant, halogen-free	UNITRONIC® BUS CAN FD P 1x2x0.25	2170272	78
	UNITRONIC® BUS CAN FD P 2x2x0.25	2170273	78
	UNITRONIC® BUS CAN FD P 1x2x0.34	2170275	78
	UNITRONIC® BUS CAN FD P 2x2x0.34	2170276	78
	UNITRONIC® BUS CAN FD P 1x2x0.5	2170278	78
	UNITRONIC® BUS CAN FD P 2x2x0.5	2170279	78
UV-resistant, burial, black	UNITRONIC® BUS CAN BURIAL 2x2x0.5	2170500	80
vibration resistant, halogen-free, UV-resistant	UNITRONIC® BUS DN THICK FRNC	2170340	76
	UNITRONIC® BUS DN THIN FRNC	2170341	76
vibration resistant, oil resistant, UV-resistant	UNITRONIC® BUS DN THICK Y	2170342	76
	UNITRONIC® BUS DN THIN Y	2170343	76

See continuation page 9

H: halogen-free
LD: Long Distance
P: PUR – Polyurethan – oil resistant
PA: Process Automation
PB: PROFIBUS®
PE: Polyethylen: can be used in food & beverage industry
PROFIBUS® PA: PROFIBUS® for Process Automation, especially in hazardous areas
ROBUST: extended use: Water, chemical resistance, soap, tenside
vibration resistant: Vibration resistant because single core ist 7-wire stranded
Y: PVC – Polyvinylchorid

Quickfinder Bus cables [Continuation]

Bus system	Inst. area	Application/cabling	Outer sheath material	Approval
DeviceNet™ (120 Ω)	indoor (UV = outdoor)	high flexible	PUR	UL/CSA (CMX)
			PVC	UL/CSA (CMG)
AS-Interface (AS-I) (70 – 140 Ω)	indoor	static/flexible	EPDM (Rubber)	
			TPE	
			PVC	UL/CSA (CMG)
		high flexible	PUR	UL (AWM)
			TPE	UL (AWM) CSA
RS485, RS422 Bus systems (100 – 120 Ω)	indoor	static	PVC	
				UL/CSA (CMX)
		high flexible	PUR	
				UL/CSA (CMX)
Fieldbus Foundation™ (100 Ω)	indoor/outdoor	static/flexible	PVC	UL/CSA (CMG)
		static	PVC	UL/CSA (CMG)
CC-Link® (110 Ω)	indoor/outdoor	static/flexible	PVC	UL (CM) CLPA
	indoor	high flexible	PUR	UL (AWM)
SafetyBUS (120 Ω)	indoor	static	H	
		high flexible	PUR	
INTERBUS® (100 Ω)	indoor	static	PVC	
				UL/CSA (CMX)
			PUR	
		high flexible	PUR	
				UL/CSA (CMX)
	outdoor	static	PVC	
European Installation Bus EIB/KNX®	indoor	static	PVC	
			H	
			PVC	

Legend

7-W:	7-Wire: 7-stranded litz, dedicatet for vibrating machine parts
CAN:	Controller Area Network
FC:	**F**ast **C**onnect (cable construction for fast connector harnessing)
FD:	high flexible (german – "Flexible Dauerbiegung")
FRNC:	Flame Retardant Not Corrosive
H:	halogen-free
LD:	Long Distance
P:	PUR – Polyurethan – oil resistant
PA:	Process Automation
PB:	PROFIBUS®
PE:	Polyethylen: can be used in food & beverage industry
PROFIBUS® PA:	PROFIBUS® for Process Automation, especially in hazardous areas
ROBUST:	extended use: Water, chemical resistance, soap, tenside
vibration resistant:	Vibration resistant because single core ist 7-wire stranded
Y:	PVC – Polyvinylchorid

*second outer sheath need to be removed before harnessing
**Standard Sub-D plug 9-pin
MC: see current main catalogue

Please see detailed technical information on the data sheet (www.lappgroup.com/products)

Characteristics	Article designation	Article number	Page
drag chain suitable, halogen-free, UV-resistant	UNITRONIC® BUS DN THICK FD P	2170344	77
	UNITRONIC® BUS DN THIN FD P	2170345	77
drag chain suitable, oil resistant, UV-resistant	UNITRONIC® BUS DN THICK FD Y	2170346	77
	UNITRONIC® BUS DN THIN FD Y	2170347	77
food & beverage industry, halogen-free	UNITRONIC® BUS ASI (G) YE	2170228	46
	UNITRONIC® BUS ASI (G) BK	2170229	46
Long Distance (2.5 mm²), saving of power supplies	UNITRONIC® BUS ASI LD(G) YE 2x2.5	2170371	46
	UNITRONIC® BUS ASI LD(G) BK 2x2.5	2170372	46
oil resistant, cold flexible	UNITRONIC® BUS ASI (TPE) YE	2170230	46
	UNITRONIC® BUS ASI (TPE) BK	2170231	46
	UNITRONIC® BUS ASI (TPE) RD	2170232	46
oil resistant	UNITRONIC® BUS ASI (PVC) A YE	2170842	46
	UNITRONIC® BUS ASI (PVC) A BK	2170843	46
oil resistant	UNITRONIC® BUS ASI (PVC) A RD	2170844	46
drag chain, oil resistant, flame-retardant, halogen-free	UNITRONIC® BUS ASI FD P FRNC YE	2170357	47
	UNITRONIC® BUS ASI FD P FRNC BK	2170358	47
drag chain, Long Distance (2.5 mm²), saving of power supplies	UNITRONIC® BUS ASI LD FD P YE 2x2.5	2170318	47
drag chain suitable, oil resistant, 105 °C	UNITRONIC® BUS ASI FD (TPE) A YE	2170830	MC
	UNITRONIC® BUS ASI FD (TPE) A BK	2170831	MC
	UNITRONIC® BUS LD 1x2x0.22	2170236*	44
	UNITRONIC® BUS LD 2x2x0.22	2170323*	44
	UNITRONIC® BUS LD 3x2x0.22	2170236*	44
	UNITRONIC® BUS LD A 1x2x0.22	2170323*	44
drag chain suitable, oil resistant	UNITRONIC® BUS LD FD P 1x2x0.25	2170236*	45
	UNITRONIC® BUS LD FD P 2x2x0.25	2170323*	45
	UNITRONIC® BUS LD FD P 3x2x0.25	2170236*	45
drag chain suitable, oil resistant	UNITRONIC® BUS LD FD P A 1x2x0.25	2170323*	45
	UNITRONIC® BUS LD FD P A 2x2x0.26	2170236*	45
	UNITRONIC® BUS LD FD P A 3x2x0.27	2170323*	45
105 °C, UV-resistant, yellow	UNITRONIC® BUS FF 3	2170350	89
105 °C, UV-resistant, yellow	UNITRONIC® BUS FF 2	2170352	89
105 °C, UV-resistant, armoured, ++ EMV, yellow	UNITRONIC® BUS FF 3 ARM (YE)	2170351	89
105 °C, UV-resistant, armoured, ++ EMV, blue	UNITRONIC® BUS FF 3 ARM (BU)	2170353	89
UV-resistant	UNITRONIC® BUS CC	2170360	90
drag chain suitable, halogen-free, oil resistant,	UNITRONIC® BUS CC FD P FRNC	2170370	90
halogen-free, vibration resistant	UNITRONIC® BUS SAFETY	2170295	91
drag chain suitable, halogen-free	UNITRONIC® BUS SAFETY FD P	2170885	91
vibration resistant	UNITRONIC® BUS IBS	2170206**	92
vibration resistant	UNITRONIC® BUS IBS A	2170209**	92
vibration resistant, COMBI 3 x 1 mm²	UNITRONIC® BUS IBS P COMBI	2170208**	92
drag chain suitable	UNITRONIC® BUS IBS FD P	2170216**	94
drag chain suitable, COMBI 3 x 1 mm²	UNITRONIC® BUS IBS FD P COMBI	2170218**	94
drag chain suitable, COMBI 3 x 1 mm²	UNITRONIC® BUS IBS FD P COMBI A	2170818**	94
vibration resistant	UNITRONIC® BUS IBS Yv	2170207**	93
vibration resistant	UNITRONIC® BUS IBS Yv COMBI	2170217**	93
	UNITRONIC® BUS EIB	2170240	95
halogen-free	UNITRONIC® BUS EIB H	2170241	95
COMBI 3 x 1.5 mm²	UNITRONIC® BUS EIB COMBI	2170242	95

Quickfinder Connector [UNITRONIC® BUS]

				EPIC® DATA PB Sub-D										EPIC® DATA PB Sub-D FC			
				35° Cable outlet		90° Cable outlet							180° Cable outlet	35° Cable outlet			
		Article number		21700507	21700506	21700504	21700503	21700530	21700529	21700541	21700543	21700542	21700505	21700511	21700513	21700514	21700515
			Page	67	67	67	67	67	67	67	67	67	67	68	68	68	68
PROFIBUS® DP (150Ohm)	UNITRONIC® BUS PB 1x2x0,64	2170220	48	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB A 1x2x0,64	2170219	48	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB FC 1x2x0,64	2170820	48	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB 105 1x2x0,64	2170630	51	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB TRAY 1x2x0,64	2170856	49	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB H FC 1x2x0,64	2170326	48											X	X	X	X
	UNITRONIC® BUS PB FRNC FC	2170853	53	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB P FC 1x2x0,64	2170330	48											X	X	X	X
	UNITRONIC® BUS PB ROBUST 1x2x0,64	2170620	50	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB PE FC 1x2x0,64	2170333	48											X	X	X	X
	UNITRONIC® BUS PB PE 1x2x0,64	2170233	48	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB 105 plus	2170635	51	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB HEAT 180 1x(2x0,64)	3031981	52	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB 7-W A 1x2x0,64	2170824	48	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB Y 7-W FC BK	2170310	58											X	X	X	X
	UNITRONIC® BUS PB 7-W FC 1x2x0,64	2170826	48											X	X	X	X
	UNITRONIC® BUS PB COMBI 7-W 1x2x0,64+3x1	2170225	48														
	UNITRONIC® BUS PB H 7-W 1x2x0,64	2170226	48	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB FD P 1x2x0,64	2170222	59	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB FD P A 1x2x0,64	2170822	60	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB FD P FC 1x2x0,64	2170322	61											X	X	X	X
	UNITRONIC® BUS PB FD P COMBI 1x2x0,64+3x1	2170227	63														
	UNITRONIC® BUS PB FD P HYBRID 1x2x0,64+4x1,5	2170495	63														
	UNITRONIC® BUS PB FD Y HYBRID 1x2x0,64+4x1,5	2170875	64														
	UNITRONIC® BUS PB FD FRNC FC	2170854	62											X	X	X	X
	UNITRONIC® BUS PB TORSION 1x2x0,8	2170332	65	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB FESTOON 1x2x0,64	2170331	66	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB ARM 1x2x0,65	2170247	54														
	UNITRONIC® BUS PB Yv 1x2x0,64	2170223	55														
	UNITRONIC® BUS PB YY 1x2x0,64	2170236	56	X	X	X	X	X	X	X	X	X	X				
	UNITRONIC® BUS PB BURIAL FC 1x2x0,64	2170323	57	X	X	X	X	X	X	X	X	X	X				
CAN CANopen® (120Ohm)	UNITRONIC® BUS CAN 1x2x0,22	2170260	78														
	UNITRONIC® BUS CAN 2x2x0,22	2170261	78														
	UNITRONIC® BUS CAN 1x2x0,34	2170263	78														
	UNITRONIC® BUS CAN 2x2x0,34	2170264	78														
	UNITRONIC® BUS CAN 1x2x0,5	2170266	78														
	UNITRONIC® BUS CAN 2x2x0,5	2170267	78														
	UNITRONIC® BUS CAN 1x2x0,75	2170269	78														
	UNITRONIC® BUS CAN 2x2x0,75	2170270	78														
	UNITRONIC® BUS CAN TRAY 2x2x0,34	2170857	79														
	UNITRONIC® BUS CAN FD P 1x2x0,25	2170272	78														
	UNITRONIC® BUS CAN FD P 2x2x0,25	2170273	78														
	UNITRONIC® BUS CAN FD P 1x2x0,34	2170275	78														
	UNITRONIC® BUS CAN FD P 2x2x0,34	2170276	78														
	UNITRONIC® BUS CAN FD P 1x2x0,5	2170278	78														
	UNITRONIC® BUS CAN FD P 2x2x0,5	2170279	78														
	UNITRONIC® BUS CAN BURIAL 4x1x0,5	2170500	80														
Device Net (120Ohm)	UNITRONIC® BUS DN THICK FRNC	2170340	76														
	UNITRONIC® BUS DN THIN FRNC	2170341	76														
	UNITRONIC® BUS DN THICK Y	2170342	76														
	UNITRONIC® BUS DN THIN Y	2170343	76														
	UNITRONIC® BUS DN THICK FD P	2170344	77														
	UNITRONIC® BUS DN THIN FD P	2170345	77														
	UNITRONIC® BUS DN THICK FD Y	2170346	77														
	UNITRONIC® BUS DN THIN FD Y	2170347	77														

EPIC® DATA PB Sub-D FC					EPIC® DATA PB Sub-D PRO						EPIC® DATA PB M12				EPIC® DATA PB CCR	EPIC® DATA CAN Sub-D			EPIC® DATA CAN Sub-D PRO		EPIC® DATA CAN CCR
90° Cable outlet				180° Cable outlet				180° Cable outlet	35° Cable outlet	90° Cable outlet	Plug, straight		Socket, straight								
21700502	21700501	21700547	21700546	21700544	21700563	21700561	21700562	21700566	21700564	21700565	22260653	22262078	22260646	22260889	21700641	21700537	21700536	21700538	21700590	21700591	21700641
68	68	68	68	68	70	70	70	70	70	70	73	73	73	73	88	83	83	83	84	84	88
					X	X	X	X	X	X	X	X	X	X	X						
					X	X	X	X	X	X	X	X	X	X	X						
					X	X	X	X	X	X					X						
					X	X	X	X	X	X	X	X	X	X							
					X	X	X	X	X	X	X	X	X	X							
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X	X	X	X	X											X						
					X	X	X	X	X	X	X	X	X	X	X						
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																X	X	X	X	X	X
																X	X	X	X	X	X
																X	X	X	X	X	X
																X	X	X	X	X	X

PROFIBUS® Fast Connect – quick and easy system installation!

Personnel expenses represent a significant cost factor in machines or plants. The cabling has a notable share in this. With the Fast Connect system, the amount of time needed to perform this work can be drastically reduced. This is possible through perfectly matched components:

FC STRIP stripping tool
article number 21124030

1. Stripping with the FC STRIP stripping tool
- The special structure of the Fast Connect cables with an inner sheath makes it possible to use the Fast Connect STRIP stripping tool
- Reduction of connection times by removing outer sheath and braided screen in just one step
- Specification of the stripping length is not necessary
- Prevention of short circuits between screening and core due to preset stripping lengths

2. Contacting the cores
- Flexibility due to assembly of the optimal cable length on site
- Prevention of incorrect connections with transparent contact lid with imprinted colour coding
- Contact assignment can be inspected when closed
- Time and cost savings due to fast and simple connector assembly

3. Fixing and securing
- When the lid is closed, the precision blades create the contact with the cores
- The cable is automatically strain relieved
- A standard screwdriver can be used, no special tool needed

All components from one source

Connectors

Advantages/benefits
- New innovative insulation displacement terminals suitable for solid and flexible conductors
- Adjustable terminating resistor is integrated
- Improved EMC features due to metallised housing
- UL-certified (File E331560)
- Fully compatible with market standard
- Versions with additional programming and diagnostics interface (PG-port) are available

Properties
- For PROFIBUS® FC standard cables, Ø 0.64 mm
- Cable outer diameter 5 to 8 mm
- Operating temperature: 0 °C to + 60 °C

See page 101

Article designation	PG	Core type	Dimensions	Diagnostic LEDs	Article number	Page
ED-PB-35-FC	no	solid or 7-wire	95 x 70 x 17 mm	no	21700511	68
ED-PB-35-PG-FC	yes	solid or 7-wire	95 x 70 x 17 mm	no	21700513	68
ED-PB-90-FC	no	solid or 7-wire	72 x 40 x 17 mm	no	21700502	68
ED-PB-90-PG-FC	yes	solid or 7-wire	72 x 40 x 17 mm	no	21700501	68
ED-PB-90-LED-FC	no	solid or 7-wire	72 x 40 x 17 mm	yes	21700547	68
ED-PB-90-PG-LED-FC	yes	solid or 7-wire	72 x 40 x 17 mm	yes	21700546	68
ED-PB-180-FC	no	solid or 7-wire	70 x 35 x 17 mm	no	21700544	68

Cables

Advantages/benefits
- High resistance against electromagnetic interference
- UL- approvals available
- UNITRONIC® PB FC cables can also be connected to EPIC® DATA connectors with screw connection

Properties
- The cables comply with the requirements of the PROFIBUS® User Organization (PNO)
- Double shielding with copper braid and plastic-laminated aluminum foil

See page 79

	Article designation	Approval	Sheath material	Temperature fixed installation	Feature	Article number	Page
Fixed installation	UNITRONIC® BUS PB FC	UL/CSA CMG	PVC, violet	-40 °C to +80 °C	–	2170820	48
	UNITRONIC® BUS PB-H FC	UL/CSA CMG	halogen-free, violet	-25 °C to +70 °C	halogen-free	2170326	48
	UNITRONIC® BUS PB P FC	UL/CSA CMX	PUR, violet	-40 °C to +70 °C	abrasion-resistant sheath	2170330	48
	UNITRONIC® BUS PB PE FC	–	PE, black	-40 °C to +60 °C	for the food industry	2170333	48
	UNITRONIC® BUS PB FRNC FC	UL/CSA CMG	FRNC, violet	-30 °C to +80 °C	halogen-free/less fumes	2170853	53
	UNITRONIC® BUS PB BURIAL FC	–	PVC/PE, black	-40 °C to +60 °C	suitable for direct burial UV-resistant	2170323	57
Flexible installation	UNITRONIC® BUS PB 7-W FC	UL/CSA CMG	PVC, violet	-40 °C to +80 °C	–	2170826	48
	UNITRONIC® BUS PB Y 7-W FC BK	–	PVC, black	-40 °C to +80 °C	outdoors, UV-resistant	2170310	58
Highly flexible installation	UNITRONIC® BUS PB FD P FC	UL/CSA CMX	PUR, violet	-40 °C to +80 °C	suitable for drag chains	2170322	61
	UNITRONIC® BUS PB FD FRNC FC	UL/CSA CMX	FRNC, violet	-40 °C to +80 °C	suitable for drag chains halogen-free/less fumes	2170854	62

Tools

Advantages/benefits
- Outer sheath and copper braid removing in just one step
- Prevents damage on the cable
- Adaptation of almost all Fast Connect cables with positioning screws

Properties
- Two step stripping tool for Fast Connect cables
- For outer diameter 2.5 – 8.0 mm

Article designation	Art. no.
FC STRIP with blade	21124030
FC STRIP without blade	21124040
FC STRIP blade	21124041

Introduction

Time consuming and costly wiring with terminal blocks and decentralized cabinets is the past. Use UNITRONIC® SENSOR for your sensor/actuator wiring.

UNITRONIC® SENSOR is consistently focused on the modular system of proven M8 and M12 connections. Easy integration into the machine concept through compact dimensions of the components. The signals from the sensors and actuators are collected via trunk lines and transferred to the controller. Timesaving installation and maintenance in troubleshooting. Errors in the signal transmission can be diagnosed by the LEDs on sockets and distribution boxes. Particularly in large machinery and equipment, which will be dismantled again before delivery to the end-customer, the modular connector system pays off. Instead of having to reassemble everything – it's only putting together and tightening the M8 or M12 threads.

The system is characterized by a high reliability even under difficult environmental conditions. The high demands on material are validated through continuous testing. For example, the several million drag chain cycles of a cable are tested in LAPP's own test center in Stuttgart. Various chemical or vibration and shock resistances as well as the IP protection classes are tested in our own laboratory.

You can find the right sensor/actuator cordsets with our assembly finder on our website:
www.lappgroup.com/assemblyfinder

Sensor/actuator boxes
In standardized connection systems, sensor/actuator boxes enable connection with all commonly used sensors and actuators and are the solution for decentralizing small-scale I/O. Regardless of whether the installation is to be performed on profiles, on even surfaces or under challenging conditions, the assembly concept ensures flexibility and reduces installation costs. The devices enable two assembly directions and are suitable for all uses. The allocation of the connectors also ensures that assembly time is kept to a minimum even under challenging conditions.

Sensor/actuator cables
Do you need to perform quick cabling of sensors and actuators in the field? Not a problem – thanks to our comprehensive range of overmoulded cables with M8, M12 and valve connectors. Signal statuses can be monitored with ease by means of the sensor/actuator cable designs featuring LEDs. Screened cables comply with the requirements concerning increased EMC compatibility.

Sensor/actuator flush-type connectors and field mountable connectors
For the purpose of connecting devices, we recommend M12 flush-type connectors with integrated stranded wire for PCB connection. Use field mountable connectors for rapid configuration of individual cable lengths for M8 and M12 sensor/actuator cables. Whether you need a screw connection or a fast connection, we will deliver according to your requirements.

Field mountable connectors [M8]

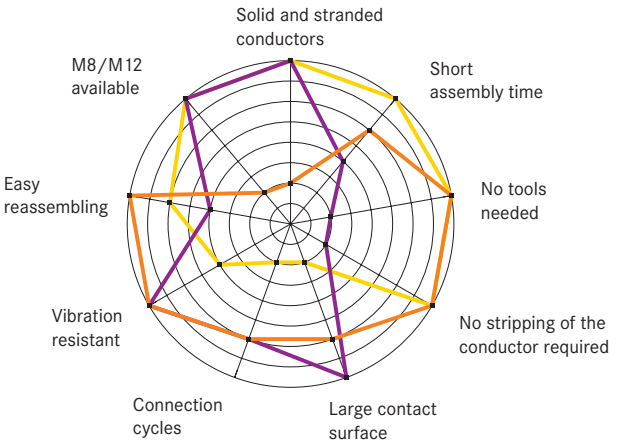
Connector M8 / Meterware for M8							Article designation	UNITRONIC® SENSOR	
								high flexible application	
								Lif9Y11Y	Lif9Y11Y
							Insulation material	PP/PUR	PP/PUR
							Dimension No. of cores x mm²	3x0.25	4x0.25
							Outer diameter (mm)	4.4	4.7
							Page	98	*
Number of contacts	Plug	Design	Connection type	⌀ (mm²)[1]	U (V)[2]	OD (mm)[3]	Article number	7038883	7038884
3- pin	Plug	Straight	Screw	0.14 – 0.5	60	3.5 – 5	22260120	X	
			IDC	0.08 – 0.25	30	2.5 – 5	22260993	X	
				0.25 – 0.5	60		22260985	X	
			Piercing	0.14 – 0.38	60	3 – 5	22260122	X	
		Angled	Screw	0.14 – 0.5	60	3.5 – 5	22262110	X	
		Straight, shielded				3.5 – 5.5	22262025	X	
	Socket	Straight	Screw	0.14 – 0.5	60	3.5 – 5	22260125	X	
			IDC	0.08 – 0.25		2.5 – 5	22260994	X	
				0.25 – 0.5			22260986	X	
			Piercing	0.14 – 0.38		3 – 5	22260124	X	
		Angled	Screw	0.14 – 0.5		3.5 – 5	22262112	X	
		Straight, shielded				3.5 – 5.5	22262026	X	
4-pin	Plug	Straight	Screw	0.14 – 0.5	30	3.5 – 5	22260121		X
			IDC	0.08 – 0.25		2.5 – 5	22260043		X
				0.25 – 0.5			22260044		X
			Piercing	0.14 – 0.38		3 – 5	22260123		X
		Angled	Screw	0.14 – 0.5		3.5 – 5	22262111		X
		Straight, shielded					22262027		X
	Socket	Straight	Screw	0.14 – 0.5	30	3.5 – 5	22260126		X
			IDC	0.08 – 0.25		2.5 – 5	22260045		X
				0.25 – 0.5			22260046		X
			Piercing	0.14 – 0.38		3 – 5	22260119		X
		Angled	Screw	0.14 – 0.5		3.5 – 5	22262113		X
		Straight, shielded		0.14 – 0.5		3.5 – 5.5	22262028		X

Legend

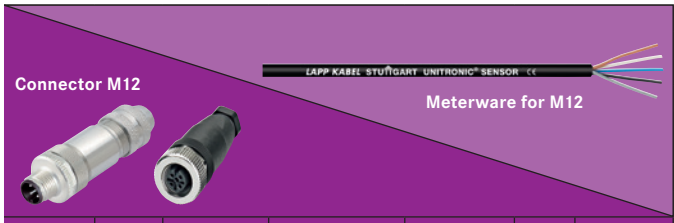
[1] Cross section
[2] Rated current
[3] Feasible outer diameter
*see www.lappgroup.com/products

TECHNICAL DATA: M8

	M8	
Number of contacts	3	4
Coding	A-Standard	
Rated current	4 A	
Material contact	CuSn	
Protection class		
– Screw	IP67	
– IDC	IP65/IP67	
– Piercing	IP68	
Temperature range (Plug/Socket)		
– Screw	-40 °C to +85 °C	
– IDC	-25 °C to +85 °C	
– Piercing	-25 °C to +85 °C	
ETIM 5.0 Class	EC002062	



Field mountable connectors [M12]



Number of contacts	Plug	Design	Connection type	∅ (mm²)[1]	U (V)[2]	OD (mm)[3]	Article number	UNITRONIC® SENSOR flexible applications LifYY	LifYY	LifY11Y	LifY11Y	DESINA®
							Insulation material	PVC/PVC	PVC/PVC	PVC/PUR	PVC/PUR	PVC/PUR
							Dimension No. of cores x mm²	3x0.34	4x0.34	4x0.34	5x0.25	4x0.34
							Outer diameter (mm)	4.8	4.8	4.8	4.9	5.2
							Page	**	**	97	97	97
4-pin	Plug	Straight	Screw	0.25 – 0.75	250	4 – 6	22260649	X	X	X		X
						6 – 8	22260995*					
			IDC	0.14 – 0.34	125	3.5 – 6	22260132	X	X	X		X
				0.34 – 0.75	250	4 – 8	22260134	X	X	X		X
		Angled	Screw	0.25 – 0.75	250	4 – 8	22260647	X	X	X		X
	Socket	Straight	Screw	0.25 – 0.75	250	4 – 8	22260640	X	X	X		X
						6 – 8	22260641*					
			IDC	0.14 – 0.34	125	3.5 – 6	22260131	X	X	X		X
				0.34 – 0.75	250	4 – 8	22260133	X	X	X		X
		Angled	Screw	0.25 – 0.75	250	4 – 8	22260636	X	X	X	X	X
5-pin	Plug	Straight	Screw	0.25 – 0.75	60	4 – 8	22260129	X	X	X	X	X
						6 – 8	22260651*					
		Straight, SKINTOP®					22260996*					
		Angled				4 – 6	22260130	X	X	X	X	X
						6 – 8	22260648*					
		Angled, SKINTOP®					22262023*					
		Straight, shielded					22260135*					
		Angled, shielded				4 – 6	22262108	X	X	X	X	X
	Socket	Straight	Screw	0.25 – 0.75	60	4 – 6	22260127	X	X	X	X	X
						6 – 8	22260644*					
		Straight, SKINTOP®					22260997*					
		Angled				4 – 6	22260128	X	X	X	X	X
						6 – 8	22260638*					
		Angled, SKINTOP®					22262024*					
		Straight, shielded					22260136*					
		Angled, shielded				4 – 6	22262109	X	X	X	X	X
8-pin	Plug	Straight, shielded	Screw	0.25 – 0.75	30	6 – 8	22260825*					
		Straight, shielded					22260826*					

Legend

[1] Cross section
[2] Rated current
[3] Feasible outer diameter

* Cables are available upon request. Alternatively we suggest to use connectors with a clamping range of 4 – 6 mm.
**see www.lappgroup.com/products

TECHNICAL DATA: M12

	M12		
Number of contacts	4	5	8
Coding	A-Standard		
Rated current			2 A
Material contact	CuSn		
Protection class			
– Screw	IP67		
– IDC	IP65/IP67		
– Piercing	IP68		

	M12
Temperature range (Plug/Socket)	
– Screw	-40°C to +85 °C
– IDC	-25°C to +85°C
– Piercing	-25°C to +85°C
ETIM 5.0 Class	EC002062

Field mountable connectors [M12]

Connector M12

Meterware for M12 suitable for drag chains

Number of contacts	Plug	Design	Connection type	∅ (mm²)[1]	U (V)[2]	OD (mm)[3]
4-pin	Plug	Straight	Screw	0.25 – 0.75	250	4 – 6
						6 – 8
			IDC	0.14 – 0.34	125	3.5 – 6
				0.34 – 0.75	250	4 – 8
		Angled	Screw	0.25 – 0.75	250	4 – 8
	Socket	Straight	Screw	0.25 – 0.75	250	4 – 8
						6 – 8
			IDC	0.14 – 0.34	125	3.5 – 6
				0.34 – 0.75	250	4 – 8
		Angled	Screw	0.25 – 0.75	250	4 – 8
5-pin	Plug	Straight	Screw	0.25 – 0.75	60	4 – 8
						6 – 8
		Straight, SKINTOP®				4 – 6
		Angled				6 – 8
		Angled, SKINTOP®				
		Straight, shielded				
		Angled, shielded				4 – 6
	Socket	Straight	Screw	0.25 – 0.75	60	4 – 6
						6 – 8
		Straight, SKINTOP®				4 – 6
		Angled				6 – 8
		Angled, SKINTOP®				
		Straight, shielded				
		Angled, shielded				4 – 6
8-pin	Plug	Straight, shielded	Screw	0.25 – 0.75	30	6 – 8
	Socket	Straight, shielded	Screw	0.25 – 0.75	30	6 – 8

Legend

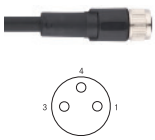
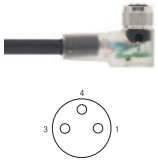
[1] Cross section
[2] Rated current
[3] Feasible outer diameter

Article designation	UNITRONIC® SENSOR FD high flexible application					UNITRONIC® SENSOR FD shielded high flexible application		
	Lif9Y11Y	Li9fY11Y	Lif9Y11Y	Lif9Y11Y	Lif9Y11Y	Lif9YC11Y	Lif9YC11Y	Lif9YC11Y
Insulation material	PP/PUR	PP/PUR	PP/PUR	PP/PUR	PP/PUR	PP/PUR	PP/PUR	PP/PUR
Dimension No. of cores x mm²	3x0.34	4x0.34	5x0.25	5x0.34	8x0.25	3x0.34	4x0.34	5x0.34
Outer diameter (mm)	4.6	4.7	4.7	5.1	5.9	4.3	4.6	5.0
Page	98	98	98	98	98	98	98	98
Article number	7038864	7038865	7038867	7038866	7038868	7038885	7038886	7038887
22260649	X	X						
22260995								
22260132	X	X						
22260134	X	X						
22260647	X	X						
22260640	X	X						
22260641								
22260131	X	X						
22260133	X	X						
22260636	X	X						
22260129	X	X						
22260651								
22260996								
22260130	X	X	X	X		X	X	X
22260648								
22262023								
22260135								
22262108	X	X	X	X		X	X	X
22260127	X	X	X	X				
22260644								
22260997								
22260128	X	X	X	X				
22260638								
22262024								
22260136								
22262109	X	X	X	X		X	X	X
22260825								
22260826								

TECHNICAL DATA: M12

	M12		
Number of contacts	4	5	8
Coding	A-Standard		
Rated current			2 A
Material contact	CuSn		
Protection class			
– Screw	IP67		
– IDC	IP65/IP67		
– Piercing	IP68		
Temperature range (Plug/Socket)			
– Screw	-40 °C to +85 °C		
– IDC	-25 °C to +85 °C		
– Piercing	-25 °C to +85 °C		
ETIM 5.0 Class	EC002062		

M8 Cordsets, A-coded [3-pin]

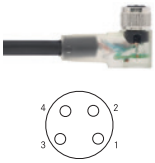
		Free conductor end	 M8 socket straight	M8 socket angled	 M8 socket angled, 2 LEDs
M8, 3-pin, PUR	**Length (m)**	**Article number**			
Free conductor end	2	–	22260202	22260203	22260275
	5	–	22260200	22260201	22260276
	10	–	22260219	22260220	22260277
M8 plug straight	0.3		22260206	22260210	22260214
	0.6		22260207	22260211	22260215
	1		22260208	22260212	22260216
	2	22260204	22260209	22260213	22260217
	5	22260205	22260938		
	10	22260218	22260935		
M8 plug angled	2	22260053			
	5	22260987			
	10	22260055			

Other lengths and variants available upon request.

TECHNICAL DATA: M8, 3-PIN

	M8	M8 with LED
Number of contacts	3	3
Rated current (V)	60	24
Rated current	4 A	
Protection class	IP65/IP67/IP68	
Material contact	CuSn	
Material contact surface	Ni/Au	
Material gripping body	TPU, flame-retardant, self- extinguishing	
Material knurl M8	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.25	
Colour code	bn (1), bu (3), bk (4)	
Material outer sheath	PUR	
Colour outer sheath	black	
Suitable for drag chains	Yes	
Minimum bending radius		
– Fixed installation	5 x Outer diameter	
– Occasional flexing	10 x Outer diameter	
Temperature range		
– Plug/Socket	-25 °C to +90 °C	
– Fixed installation	-40 °C to +80 °C	
– Occasional flexing	-25 °C to +80 °C	
Flame retardant acc.	UL 1581 FT-2	
Halogen free acc.	DIN VDE 0472	
Approvals	UL: E249137	
ETIM 5.0 Class	EC001855	

M8 Cordsets, A-coded [4-pin]

		Free conductor end	M8 socket straight	M8 socket angled	 M8 socket angled, 2 LEDs
M8, 4-pin, PUR	**Length (m)**	**Article number**			
Free conductor end	2	-	22260309	22260311	
	5	-	22260310	22260312	22262076
	10	-	22260317	22260319	
M8 plug straight	0.3		22260313	22260059	
	0.6		22260314	22260060	
	1		22260315	22260061	
	2	22260300	22260316	22260062	
	5	22260308	22260923		
	10	22260318	22260922		
M8 plug angled	2	22260056			
	5	22260057			
	10	22260058			

Other lengths and variants available upon request.

TECHNICAL DATA: M8, 4-PIN

	M8	M8 with LED
Number of contacts	4	4
Rated current (V)	30	24
Rated current	4 A	
Protection class	IP65/IP67/IP68	
Material contact	CuSn	
Material contact surface	Ni/Au	
Material gripping body	TPU, flame-retardant, self- extinguishing	
Material knurl M8	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.25	
Colour code	bn (1), wh (2), bu (3), bk (4)	
Material outer sheath	PUR	
Colour outer sheath	black	
Suitable for drag chains	Yes	
Minimum bending radius		
– Fixed installation	5 x Outer diameter	
– Occasional flexing	10 x Outer diameter	
Temperature range		
– Plug/Socket	-25 °C to +90 °C	
– Fixed installation	-40 °C to +80 °C	
– Occasional flexing	-25 °C to +80 °C	
Flame retardant acc.	UL 1581 FT-2	
Halogen free acc.	DIN VDE 0472	
Approvals	UL: E249137	
ETIM 5.0 Class	EC001855	

M12 Cordsets, shielded, PUR, A-coded [3-, 4-, 5-, 8-pin]

Free conductor end

3-pin

4-pin

5-pin

8-pin

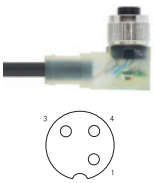
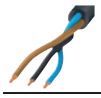
	M12, shielded, 3-, 4-, 5-, 8-pin, PUR	Length (m)	Article number			
M12 plug	M12 plug straight	2	22260453	22260459	22260465	
		5	22260454	22260460	22260466	22260733
		10	22260455	22260461	22260467	22262189
	M12 plug angled	2		22262125	22261004	
		5			22261005	
		10				
M12 socket	M12 socket straight	2	22260450	22260456	22260462	
		5	22260451	22260457	22260463	22260863
		10	22260452	22260458	22260464	22262001
	M12 socket angled	2	22260071	22260074	22260946	
		5	22260072	22260075	22260714	22260859
		10	22260073	22260076	22260991	

Other lengths and variants available upon request.

TECHNICAL DATA: M12, SHIELDED, 3-, 4-, 5-, 8-PIN

	M12 on free conductor end			
Number of contacts	3	4	5	8
Rated current (V)	250		60	30
Rated current	4 A			2 A
Protection class	IP65/IP67/IP68			
Material contact	CuSn			
Material contact surface	Ni/Au			
Material gripping body	TPU, flame-retardant, self- extinguishing			
Material knurl M12	Zinc die-cast, nickel plated			
Core cross-section (mm²)	0.34			0.25
Colour code	bn (1), bu (3), bk (4)	bn (1), wh(2), bu (3), bk (4)	bn (1), wh (2), bu (3), bk (4), gy (5)	wh (1), bn (2), gn (3), ye (4), gy (5), pk (6), bu (7), rd (8)
Material outer sheath	PUR			
Colour outer sheath	black			
Suitable for drag chains	Yes			
Minimum bending radius				
– Fixed installation	5 x Outer diameter			
– Occasional flexing	10 x Outer diameter			
Temperature range				
– Plug/Socket	-25 °C to +90 °C			
– Fixed installation	-40 °C to +80 °C			
– Occasional flexing	-25 °C to +80 °C			
Flame retardant acc.	UL 1581 FT-2			
Halogen free acc.	DIN VDE 0472			
Approvals	UL: E249137			
ETIM 5.0 Class	EC001855			

M12 Cordsets, A-coded [3-pin]

		Free conductor end	M12 socket straight	M12 socket angled	M12 socket straight, 2 LEDs	 M12 socket angled, 2 LEDs
M12, 3-pin, PUR	**Length (m)**	**Article number**				
Free conductor end 	2	-	22260257	22260258	22260252	22260253
	5	-	22260250	22260259	22260265	22260254
	10	-	22260251	22260260	22260266	22260255
M12 plug straight	0.3		22260233	22260237		22260261
	0.6		22260234	22260238		22260262
	1		22260235	22260239		22260263
	2	22260221	22260236	22260240		22260264
	5	22260222				22260667
	10	22260249	22260920			
M12 plug angled	2	22260223				
	5	22260224				
	10	22260256				

Other lengths and variants available upon request.

TECHNICAL DATA: M12, 3-PIN

	M12	M12 with LED
Rated current (V)	250	24
Rated current	4 A	
Protection class	IP65/IP67/IP68	
Material contact	CuSn	
Material contact surface	Ni/Au	
Material gripping body	TPU, flame-retardant, self- extinguishing	
Material knurl M12	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.34	
Colour code	bn (1), bu (3), bk (4)	
Material outer sheath	PUR	
Colour outer sheath	black	
Suitable for drag chains	Yes	
Minimum bending radius		
– Fixed installation	5 x Outer diameter	
– Occasional flexing	10 x Outer diameter	
Temperature range		
– Plug/Socket	-25 °C to +90°C	
– Fixed installation	-40 °C to +80 °C	
– Occasional flexing	-25 °C to +80 °C	
Flame retardant acc.	UL 1581 FT-2	
Halogen free acc.	DIN VDE 0472	
Approvals	UL: E249137	
ETIM 5.0 Class	EC001855	

M12 Cordsets, A-coded [4-pin]

M12, 4-pin, PUR	Length (m)	Free conductor end	M12 socket straight	M12 socket angled	M12 socket straight, 2 LEDs	M12 socket angled, 3 LEDs
		Article number				
Free conductor end	2	-	22260322	22260324	22260344	22260326
	5	-	22260323	22260325	22260345	22260327
	10	-	22260343	22260341	22260346	22260340
M12 plug straight	0.3		22260328	22260332		22260336
	0.6		22260329	22260333		22260337
	1		22260330	22260334		22260338
	2	22260320	22260331	22260335		22260339
	5	22260321	22260702	22262066		
	10	22260342	22260710	22260851		
M12 plug angled	0.3		22260304			
	0.6		22260305			
	1		22260306	22260965		
	2	22260301	22260307	22260693		
	5	22260302				
	10	22260303				

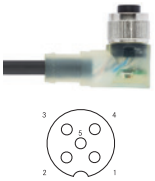
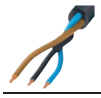
Other lengths and variants available upon request.

TECHNICAL DATA: M12, 4-PIN

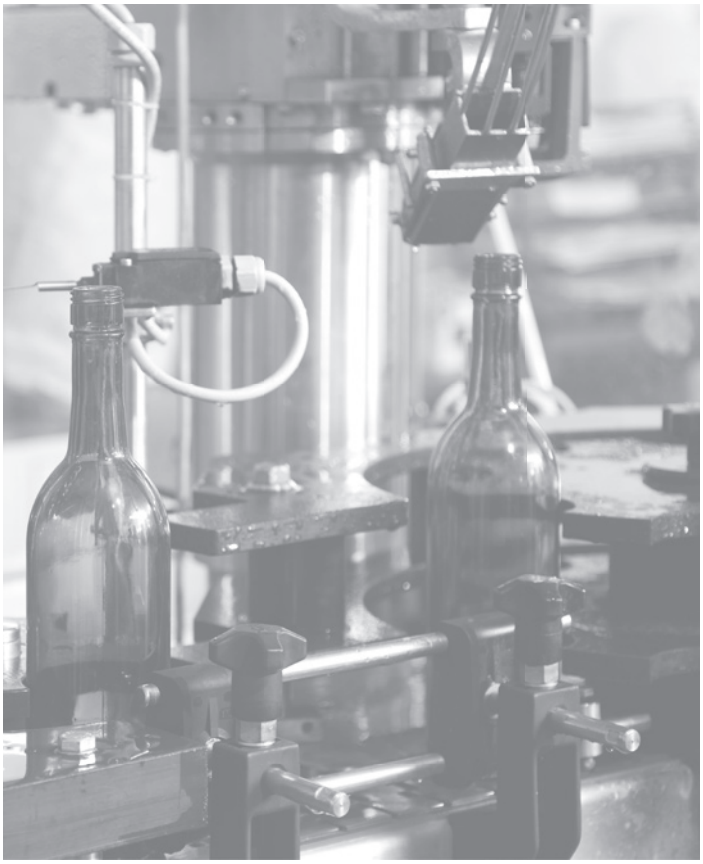
	M12	M12 with LED
Rated current (V)	250	24
Rated current	4 A	
Protection class	IP65/IP67/IP68	
Material contact	CuSn	
Material contact surface	Ni/Au	
Material gripping body	TPU, flame-retardant, self- extinguishing	
Material knurl M12	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.34	
Colour code	bn (1), wh (2), bu (3), bk (4)	
Material outer sheath	PUR	
Colour outer sheath	black	
Suitable for drag chains	Yes	

	M12	M12 with LED
Minimum bending radius		
– Fixed installation	5 x Outer diameter	
– Occasional flexing	10 x Outer diameter	
Temperature range		
– Plug/Socket	-25 °C to +90 °C	
– Fixed installation	-40 °C to +80 °C	
– Occasional flexing	-25 °C to +80 °C	
Flame retardant acc.	UL 1581 FT-2	
Halogen free acc.	DIN VDE 0472	
Approvals	UL: E249137	
ETIM 5.0 Class	EC001855	

M12 Cordsets, A-coded [5-pin]

		Free conductor end	M12 socket straight	M12 socket angled	 M12 socket angled, 3 LEDs
M12, 5-pin, PUR	**Length (m)**	**Article number**			
Free conductor end 	2	-	22260404	22260406	22260408
	5	-	22260405	22260407	22260409
	10	-	22260415	22260418	22260416
M12 plug straight	0.3		22260410	22260063	22260067
	0.6		22260411	22260064	22260068
	1		22260412	22260065	22260069
	2	22260400	22260413	22260066	22260070
	5	22260401	22260724		
	10	22260414	22260723		
M12 plug angled	2	22260402			
	5	22260403			
	10	22260417			

Other lengths and variants available upon request.



TECHNICAL DATA: M12, 5-PIN

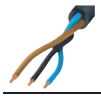
	M12	M12 with LED
Rated current (V)	60	24
Rated current	4 A	
Protection class	IP65/IP67/IP68	
Material contact	CuSn	
Material contact surface	Ni/Au	
Material gripping body	TPU, flame-retardant, self- extinguishing	
Material knurl M12	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.34	
Colour code	bn (1), wh (2), bu (3), bk (4), gn/ye (5)	
Material outer sheath	PUR	
Colour outer sheath	black	
Suitable for drag chains	Yes	
Minimum bending radius		
- Fixed installation	5 x Outer diameter	
- Occasional flexing	10 x Outer diameter	
Temperature range		
- Plug/Socket	-25 °C to +90 °C	
- Fixed installation	-40 °C to +80 °C	
- Occasional flexing	-25 °C to +80 °C	
Flame retardant acc.	UL 1581 FT-2	
Halogen free acc.	DIN VDE 0472	
Approvals	UL: E249141	
ETIM 5.0 Class	EC001855	

M12 Cordsets, A-coded [8-pin]

Free conductor end

M12 socket straight

M12 socket angled

M12, 8-pin, PUR	Length (m)	Article number		
Free conductor end 	2	-	22260726	22260141
	5	-	22260728	22260615
	10	-	22260729	22260616
M12 plug straight	0.3		22260097	22260137
	0.6		22260098	22260138
	1		22260099	22260139
	2	22260091	22260042	22260140
	5	22260092		
	10	22260093		
M12 plug angled	2	22260094		
	5	22260095		
	10	22260096		

Other lengths and variants available upon request.

TECHNICAL DATA: M12, 8-PIN

	M12
Rated current (V)	30
Rated current	2 A
Protection class	IP65/IP67/IP68
Material contact	CuSn
Material contact surface	Ni/Au
Material gripping body	TPU, flame-retardant, self-extinguishing
Material knurl M12	Zinc die-cast, nickel plated
Core cross-section (mm²)	0.25
Colour code	wh (1), bn (2), gn (3), ye (4), gy (5), pk (6), bu (7), rd (8)
Material outer sheath	PUR
Colour outer sheath	black
Suitable for drag chains	Yes
Minimum bending radius	
- Fixed installation	5 x Outer diameter
- Occasional flexing	10 x Outer diameter
Temperature range	
- Plug/Socket	-25 °C to +90 °C
- Fixed installation	-40 °C to +80 °C
- Occasional flexing	-25 °C to +80 °C
Flame retardant acc.	UL 1581 FT-2
Halogen free acc.	DIN VDE 0472
Approvals	UL: E249143
ETIM 5.0 Class	EC001855

Cordsets M8 on M12, A-coded [3-pin]

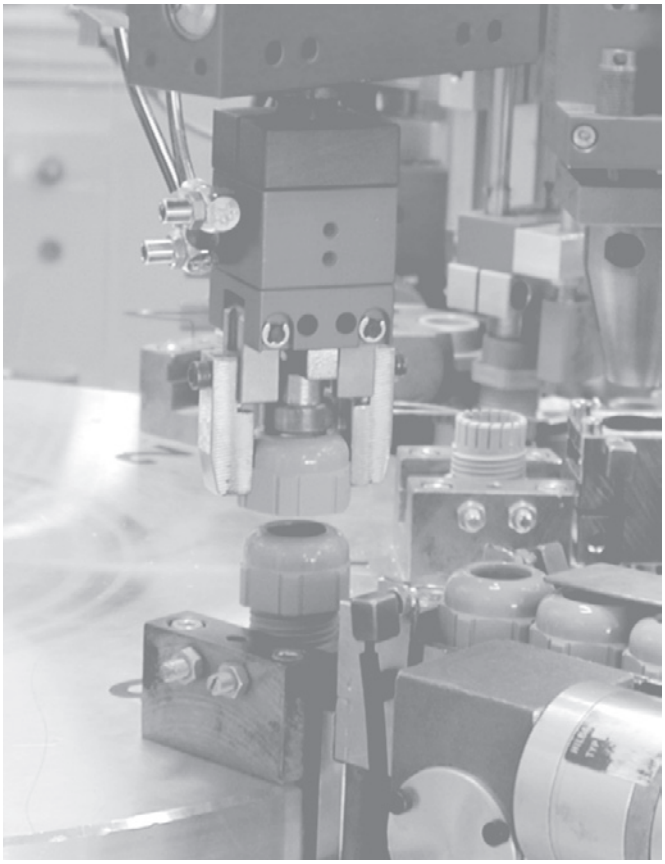
M12 socket
straight

M12 socket
angled

M12 socket
angled, 2 LEDs

M8 on M12, 3-pin, PUR	Length (m)	Article number		
M8 plug straight	0.3	22260241	22260245	22260271
	0.6	22260242	22260246	22260272
	1	22260243	22260247	22260273
	2	22260244	22260248	22260274

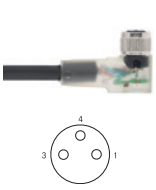
Other lengths and variants available upon request.



TECHNICAL DATA: M8 ON M12

	M8 on M12	M8 on M12 LED
Rated current (V)	60	24
Rated current	4 A	
Protection class	IP65/IP67/IP68	
Material contact	CuSn	
Material contact surface	Ni/Au	
Material gripping body	TPU, flame-retardant, self-extinguishing	
Material knurl	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.25	
Colour code	bn (1), bu (3), bk (4)	
Material outer sheath	PUR	
Colour outer sheath	black	
Suitable for drag chains	Yes	
Minimum bending radius		
– Fixed installation	5 x Outer diameter	
– Occasional flexing	10 x Outer diameter	
Temperature range		
– Plug/Socket	-25 °C to +90 °C	
– Fixed installation	-40 °C to +80 °C	
– Occasional flexing	-25 °C to +80 °C	
Flame retardant acc.	UL 1581 FT-2	
Halogen free acc.	DIN VDE 0472	
Approvals	UL: E249137	
ETIM 5.0 Class	EC001855	

Cordsets M12 on M8, A-coded [3-/4-pin]

		M8 socket straight	M8 socket angled	 M8 socket angled, 2 LEDs	M8 socket straight (4-pin)
M12 on M8, 3-/4-pin, PUR	**Length (m)**	**Article number**			
M12 plug straight (3-pin)	0.3	22260225	22260229	22260267	
	0.6	22260226	22260230	22260268	
	1	22260227	22260231	22260269	
	2	22260228	22260232	22260270	
M12 plug straight (4-pin)	0.3				22260347
	0.6				22260349
	1				22260350
	2				22260348

Other lengths and variants available upon request.

TECHNICAL DATA: M12 ON M8

	M12 on M8	M12 on M8 with LED	M12 on M8
Number of contacts	3	3	4
Rated current (V)	60	24	30
Rated current	4 A		
Protection class	IP65/IP67/IP68		
Material contact	CuSn		
Material contact surface	Ni/Au		
Material gripping body	TPU, flame-retardant, self-extinguishing		
Material knurl	Zinc die-cast, nickel plated		
Core cross-section (mm²)	0.25		
Colour code	bn (1), bu (3), bk (4)		bn (1), wh (2), bu (3), bk (4)
Material outer sheath	PUR		
Colour outer sheath	black		
Suitable for drag chains	Yes		
Minimum bending radius			
- Fixed installation	5 x Outer diameter		
- Occasional flexing	10 x Outer diameter		
Temperature range			
- Plug/Socket	-25 °C to +90 °C		
- Fixed installation	-40 °C to +80 °C		
- Occasional flexing	-25 °C to +80 °C		
Flame retardant acc.	UL 1581 FT-2		
Halogen free acc.	DIN VDE 0472		
Approvals	UL: E249137		
ETIM 5.0 Class	EC001855		

Y-distributor, A-coded [M12 3-pin]

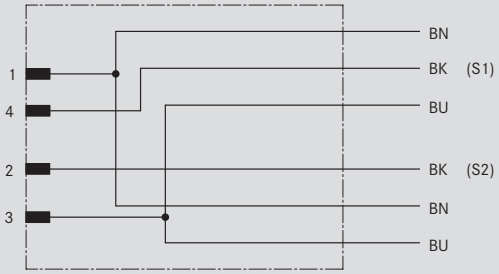
free conductor end

M12 3-pin, 2 x 3 x 0.34 mm²	Length (m)	Article number
	2	22260500
	5	22260513
	10	22260526

Other lengths and variants available upon request.

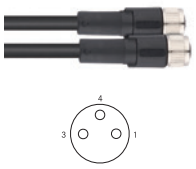
Please observe the technical information on the next page.

CIRCUIT DIAGRAM



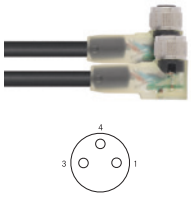
Y-distributor M12Y on free conductor end

Y-distributor, A-coded [M12 3-pin]



2 x M8 socket straight

2 x M8 socket angled

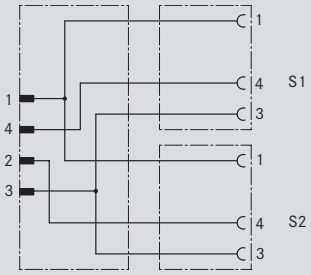


2 x M8 socket angled, 2 LEDs

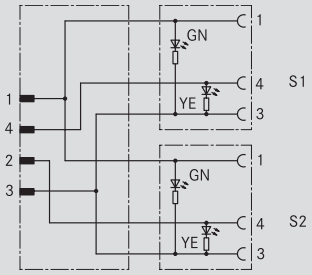
M12 3-pin, 2 x 3 x 0.25 mm²	Length (m)	Article number		
	0.3	22260514	22260518	22260522
	0.6	22260515	22260519	22260523
	1	22260516	22260520	22260524
	2	22260517	22260521	22260525

Other lengths and variants available upon request.

CIRCUIT DIAGRAM

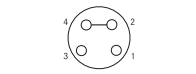


Y-distributor M12Y on M8



Y-distributor M12Y on M8 LED

Y-distributor, A-coded [M12 3-pin]



2 x M12 socket straight

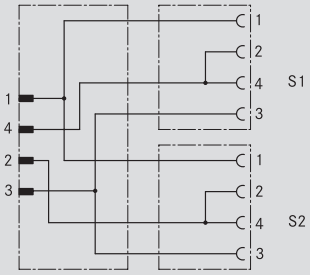
2 x M12 socket angled

2 x M12 socket angled, 2 LEDs

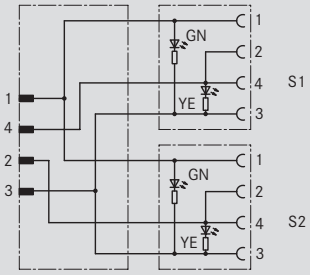
M12 3-pin, 2 x 3 x 0.34 mm²	Length (m)	Article number		
	0.3	22260501	22260505	22260509
	0.6	22260502	22260506	22260510
	1	22260503	22260507	22260511
	2	22260504	22260508	22260512

Other lengths and variants available upon request.

CIRCUIT DIAGRAM



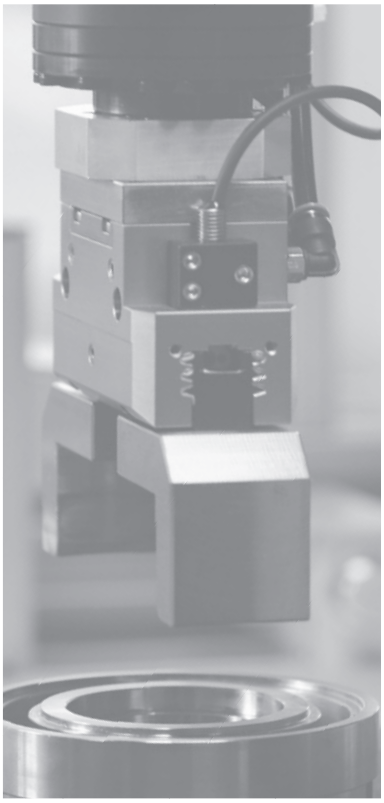
Y-distributor M12Y on M12



Y-distributor M12Y on M12 LED

TECHNICAL DATA: M12

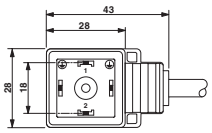
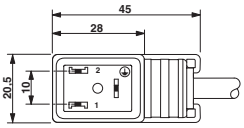
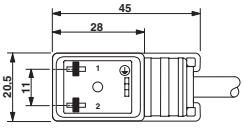
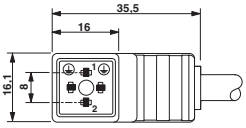
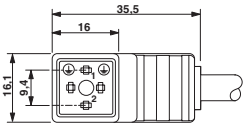
	on free conductor end	on 2 x M8	on 2 x M8 with LED	on 2 x M12	on 2 x M12 with LED
Rated current (V)	250	60	24	250	24
Rated current	4 A				
Protection class	IP65/IP67/IP68				
Material contact	CuSn				
Material contact surface	Ni/Au				
Material gripping body	TPU, flame-retardant, self-extinguishing				
Material knurl	Zinc die-cast, nickel plated				
Colour code	bn (1), bu (3), bk (4)				
Material outer sheath	PUR				
Colour outer sheath	black				
Suitable for drag chains	Yes				
Minimum bending radius					
– Fixed installation	5 x Outer diameter				
– Occasional flexing	10 x Outer diameter				
Temperature range					
– Plug/Socket	-25 °C to +90 °C				
– Fixed installation	-40 °C to +80 °C				
– Occasional flexing	-25 °C to +80 °C				
Approvals	UL: E249137				
ETIM 5.0 Class	EC001855				



Valve connector cordsets [3-pin]

free conductor end

M12 plug, A-coded

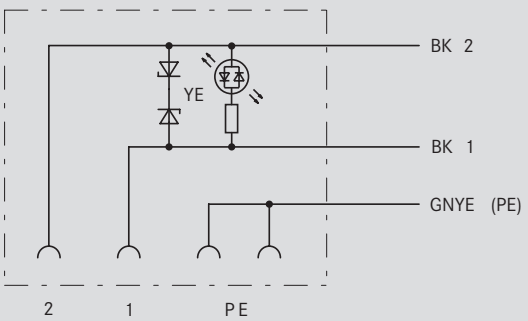
Design		Length (m)	Article number	Length (m)	Article number
Type A Z-Diode 1 LED		2.0	22260584	0.3	22260550
		5.0	22260576	0.6	22260551
		10.0	22260577	1.0	22260552
				2.0	22260553
Type B Z-Diode 1 LED		2.0	22260585	0.3	22260558
		5.0	22260578	0.6	22260559
		10.0	22260579	1.0	22260560
				2.0	22260561
Type BI Z-Diode 1 LED		2.0	22260586	0.3	22260554
		5.0	22260580	0.6	22260555
		10.0	22260581	1.0	22260556
				2.0	22260557
Type C Z-Diode 1 LED		2.0	22260587	0.3	22260566
		5.0	22260582	0.6	22260567
		10.0	22260583	1.0	22260568
				2.0	22260569
Type CI Z-Diode 1 LED		2.0	22260588		
		5.0	22260574		
		10.0	22260575		

Other lengths and variants available upon request.

TECHNICAL DATA

Valve connectors	on free conductor end	on M12
Rated current (V)	24	
Rated current	4 A	
Protection class	IP65/IP67	
Material contact	CuSn	
Material gripping body M12	TPU, flame-retardant, self-extinguishing	
Material knurl M12	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.75 (3-pin)	
Colour code	black with white numbers and green/yellow	
Material outer sheath	PUR	
Colour outer sheath	black	
Outer diameter (mm)	4.5 (3-pin)	
Suitable for drag chains	Yes	
Minimum bending radius		
– Fest verlegt	5 x Outer diameter	
– Occasional flexing	10 x Outer diameter	
Temperature range		
– Plug/Socket	-25 °C to +90 °C	
– Valve connector	-20 °C to +85 °C	
– Fixed installation	-40 °C to +80 °C	
– Occasional flexing	-20 °C to +80 °C	
Halogen free acc.	DIN VDE 0472	
ETIM 5.0 Class	EC001855	

CIRCUIT DIAGRAM

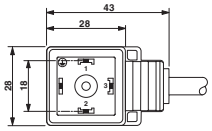


Valve connector 3-pin

Valve connector cordsets [5-pin]

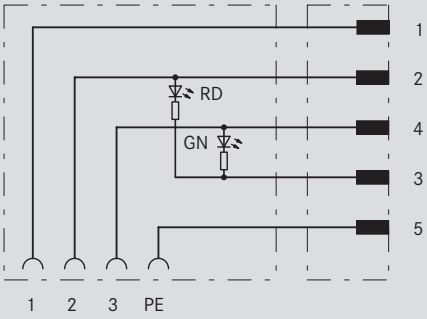
free conductor end

M12 plug, A-coded

Design		Length (m)	Article number	Length (m)	Article number
Type A for pressure switch 2 LEDs		2.0	22260589	0.3	22260573
		5.0	22260590	0.6	22260572
		10.0	22260591	1.0	22260571
				2.0	22260570

Other lengths and variants available upon request.

CIRCUIT DIAGRAM



Valve connector 5-pin (type AD) on M12

TECHNICAL DATA

Valve connectors	on free conductor end	on M12
Rated current (V)	24	
Rated current	4 A	
Protection class	IP65/IP67	
Material contact	CuSn	
Material gripping body M12	TPU, flame-retardant, self-extinguishing	
Material knurl M12	Zinc die-cast, nickel plated	
Core cross-section (mm²)	0.5 (5-pin)	
Colour code	black with white numbers and green/yellow	
Material outer sheath	PUR	
Colour outer sheath	black	
Outer diameter (mm)	5.3 (5-pin)	
Suitable for drag chains	Yes	
Minimum bending radius		
– Fest verlegt	5 x Outer diameter	
– Occasional flexing	10 x Outer diameter	
Temperature range		
– Plug/Socket	-25 °C to +90 °C	
– Valve connector	-20 °C to +85 °C	
– Fixed installation	-40 °C to +80 °C	
– Occasional flexing	-20 °C to +80 °C	
Halogen free acc.	DIN VDE 0472	
ETIM 5.0 Class	EC001855	

Further Portfolio

PVC – Portfolio

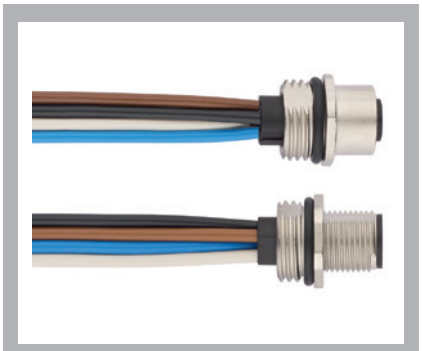
UNITRONIC® SENSOR PVC
In addition to our PUR standard range we offer M8 and M12 assemblies with PVC material. These are particularly suitable for medium mechanical stress in dry areas.

Shielded M12 Cordsets

The shielded UNITRONIC® SENSOR M12 SH protects against electromagnetic interference, giving you peace of mind when transmitting signals in electromagnetic environments.

Distribution boxes and accessories

Distributor in M8/M12 for simple signal bundling and for optimising individual wiring. Available with master cable attached or for individual assembly.



Flush-type connectors

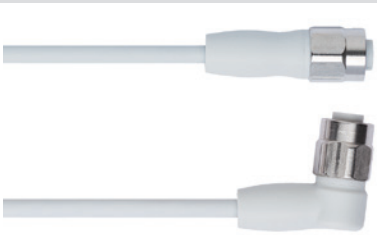
EPIC® SENSOR M8/M12 flush-type connectors, particularly suitable as a panel feed-through and for the cabinet. Versions for rear and front mounting offer flexible connection solutions for individual device concepts.

This and other information can be found here:

www.lappgroup.com/sensoractuator-cabling

Hygienic design for Food & Beverage

At direct contact with food, components must meet the highest hygienic requirements. With an optimized design, stainless steel and resistant materials at UNITRONIC® SENSOR HD M12 you get with optimum cleaning results.



EPIC® SENSOR

Our wide range of field-mountable EPIC® SENSOR M8/M12 connectors enables you to individually adapt the cabling to a perfect match at your application. With different types of connection in shielded and unshielded versions.

M12 power wiring

We offer UNITRONIC® SENSOR M12 Power assemblies with A-coding and T-coded, field-mountable EPIC® POWER M12 60 V connectors for safe power transmission cabling.

UNITRONIC® BUS LD

Flexible buscable with PVC outer sheath, for use in different bussystems

Info

- LD is a LAPP abbreviation for long distance

Benefits

- Suitable for multiple Bus systems based on RS485 / RS422

Application range

- For fixed installation
  Maximum electromagnetic screening
- Bus cables for bus systems such as e.g. Modbus, SUCOnet P, Modulink P, VariNet-P)
- Dry or damp rooms

Product features

- The stated bit rates result in the following cable lengths (maximum) of one bus segment:
- 9.6-93.75 kbit/s = 1200m
- 187.5 kbit/s = max. 1,000 m
- 500 kbit/s = max. 400 m

Norm references / Approvals

- UNITRONIC® BUS LD A:
  UL versions with certification:
  UL/CSA type CMX acc. to UL 444
  and CSA C22.2 no. 214-02
- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- Stranded conductor, bare, 7-wire
- Core insulation: PE
- Colour code DIN 47100
- Overall screening of braided tinned-copper strands
- Outer sheath: PVC, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
Flexible use: 10 x outer diameter

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 186 ohm/km

Minimum bending radius
Fixed installation: 8 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
100 - 120 Ohm

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -5°C to +70°C

Article number	Article designation	Number of pairs and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
for fixed installation					
2170203	UNITRONIC® BUS LD	1 x 2 x 0,22	5.7	18	37
2170204	UNITRONIC® BUS LD	2 x 2 x 0,22	7.1	28	45
2170205	UNITRONIC® BUS LD	3 x 2 x 0,22	7.2	37	72
For fixed installation - UL/CSA CMX certification					
2170803	UNITRONIC® BUS LD A	1 x 2 x 0,22	5.7	18	39

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Modubus is owned by the Modbus-IDA Organisation. SUCOnet P is a registered trademark of the Moeller Group. Modulink P is a registered trademark of Weidmüller GmbH & Co. VariNet is a registered trademark of Pepperl+Fuchs GmbH.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

UNITRONIC® BUS LD FD P

Highly flexible buscable with PUR outer sheath, for use in different bussystems

Info

- LD is a LAPP abbreviation for long distance

Benefits

- Suitable for multiple Bus systems based on RS485 / RS422
- PUR outer sheath, tear and notch-resistant, resistant to mineral oils and abrasion when used in power chains
- Under consideration of the temperature range also suitable for outdoor use

Application range

- For highly flexible applications (power chains, moving machine parts)
- Bus cables for bus systems such as e.g. Modbus, SUCOnet P, Modulink P, VariNet-P)

Product features

- The stated bit rates result in the following cable lengths (maximum) of one bus segment:
- 9.6-93.75 kbit/s = 1200m
- 187.5 kbit/s = max. 1,000 m
- 500 kbit/s = max. 400 m
- UV-resistant (but colour may change after some time)

Norm references / Approvals

- UNITRONIC® BUS LD FD P A: UL versions with certification: UL/CSA type CMX acc. to UL 444 and CSA C22.2 no. 214-02
- Flame-retardant according IEC 60332-1-2

Product Make-up

- Extra-fine wire strand made of bare copper
- Colour code DIN 47100
- Core insulation: PE
- Overall screening of braided tinned-copper strands
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz) max. 60 nF/km

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 159.8 ohm/km

Minimum bending radius
Fixed installation: 6 x core diameter
One bend at end of core: 3 x cable diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
100 - 120 Ohm

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C

Article number	Article designation	Number of pairs and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
For highly flexible applications					
2170213	UNITRONIC® BUS LD FD P	1 x 2 x 0,25	6	18	39
2170214	UNITRONIC® BUS LD FD P	2 x 2 x 0,25	7.9	33	65
2170215	UNITRONIC® BUS LD FD P	3 x 2 x 0,25	8	39	77
For highly flexible applications - with UL/CSA CMX certification					
2170813	UNITRONIC® BUS LD FD P A	1 x 2 x 0,25	6.2	18	39
2170814	UNITRONIC® BUS LD FD P A	2 x 2 x 0,25	8.3	33	65
2170815	UNITRONIC® BUS LD FD P A	3 x 2 x 0,25	8.4	39	77

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Modubus is owned by the Modbus-IDA Organisation. SUCOnet P is a registered trademark of the Moeller Group. Modulink P is a registered trademark of Weidmüller GmbH & Co. VariNet is a registered trademark of Pepperl+Fuchs GmbH.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- SMART STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS ASI

AS-INTERFACE cables for networking systems in the field

Info

- „LD“ = Long Distance

Benefits

- The new BUS ASI LD 2 x 2.5 (Long Distance) allows even modules located further away to be connected. AS-I power supplies can be reduced. The BUS ASI LD is downwards-compatible with version 1.5.
- The rubber versions are halogen-free

Application range

- Communication at sensor/actuator level
- Sensor-/actuator wiring
- For fixed installation as well as occasional flexing at free, non-continuously recurring movement without tensile load
- The TPE version has an oil-resistant outer sheath. It is suitable for wet areas, in particular in conjunction with water-soluble cooling lubricants.

Product features

- Data and power are transmitted via an unscreened, geometrically coded two-core flat cable (protection against polarity reversal).
- The conductor is contacted by „piercing technology“ within the ASI modules.
- The sensors are connected to the ASI modules (coupling modules) using round cables (connection cables).

Norm references / Approvals

- ASI is standardised Europe-wide in EN 50295 and internationally in IEC 62026-2.
- PVC A version with UL/CSA (CMX) certification
- UL/CSA version: CMG c(UL)us or (UL)CL2 or AWM 300V FT4 certified

Product Make-up

- Conductor: fine-wire tinned-copper strands
- Core insulation: blue and brown
- Outer sheath:
  rubber (G), halogenfree
  thermoplastic elastomers (TPE)
  PVC
- Outer sheath: yellow (RAL 1023), black (RAL 9005), red (RAL 3000)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
Yellow: 300 V (not for power applications)
Black: 300 V (not for power applications)
Red: 300 V

Conductor resistance
1.5 mm²: max. 13.7 Ohm/km
2.5 mm²: max. 8.21 Ohm/km

Minimum bending radius
Fixed installation: 12 mm
Flexible use 24 mm

Test voltage
Core/core: 2000 V

Temperature range
Dependent on outer sheath material:
PVC: -30°C to +90°C
Other materials: -40°C to +85°C
During installation:
PVC -20 °C to +90 °C
Other materials:
-30 °C to +85 °C

Article number	Article designation	Outer sheath colour	Application	Number of cores and mm² per conductor	Copper index (kg/km)	Weight (kg/km)
Gummi/EPDM						
2170228	UNITRONIC® BUS ASI (G)	yellow	Data and power transmission	2 x 1,5	29	85
2170229	UNITRONIC® BUS ASI (G)	black	Transmission of 30 V DC auxiliary power	2 x 1,5	29	85
2170371	UNITRONIC® BUS ASI LD (G)	yellow	Data and power transmission	2 x 2,5	48	85
2170372	UNITRONIC® BUS ASI LD (G)	black	Transmission of 30 V DC auxiliary power	2 x 2,5	48	85
TPE						
2170230	UNITRONIC® BUS ASI (TPE)	yellow	Data and power transmission	2 x 1,5	29	64
2170231	UNITRONIC® BUS ASI (TPE)	black	Transmission of 30 V DC auxiliary power	2 x 1,5	29	64
2170232	UNITRONIC® BUS ASI (TPE)	red	Transmission of 230 V AC auxiliary power	2 x 1,5	29	64
PVC						
2170842	UNITRONIC® BUS ASI (PVC) A	yellow	Data and power transmission	2 x 1,5	29	70
2170843	UNITRONIC® BUS ASI (PVC) A	black	Transmission of 30 V DC auxiliary power	2 x 1,5	29	70
2170844	UNITRONIC® BUS ASI (PVC) A	red	Transmission of 230 V AC auxiliary power	2 x 1,5	29	70

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Lapp Kabel is a member of the AS-International Association
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® DIX-M AUTOMATION refer to main catalogue 2018/19
- AS-I clip clamp / AS-I end sealing refer to main catalogue 2018/19
- UNIVERSAL STRIP stripping tool refer to main catalogue 2018/19
- AS-I STRIP special stripping tool refer to main catalogue 2018/19
- AS-I STRIP special refer to main catalogue 2018/19
- SKINTOP® DIX ASI refer to main catalogue 2018/19

UNITRONIC® BUS ASI FD

High flexible AS-INTERFACE cables for networking systems in the field

Info

- „FD“ = suitable for power chains
- „LD“ = Long Distance

Benefits

- The new BUS ASI LD 2 x 2.5 (Long Distance) allows even modules located further away to be connected. AS-I power supplies can be reduced. The BUS ASI LD is downwards-compatible with version 1.5.
- For highly flexible applications (power chains, moving machine parts)
- High oil-resistance

Application range

- Communication at sensor/actuator level
- Sensor-/actuator wiring

Product features

- PUR versions are halogen-free according to IEC 60754-1
- Flame-retardant according to IEC 60332-1-2, UL FT-2 flame test
- Data and power are transmitted via an unscreened, geometrically coded two-core flat cable (protection against polarity reversal).
- The conductor is contacted by „piercing technology“ within the ASI modules.
- The sensors are connected to the ASI modules (coupling modules) using round cables (connection cables).

Norm references / Approvals

- ASI is standardised Europe-wide in EN 50295 and internationally in IEC 62026-2.
- TPE variant: UL AWM Style 2103 CSA AWM II A/B
- PUR versions: UL AWM Style 20549

Product Make-up

- Extra-fine wire, tinned copper strands
- Core insulation: halogen-free compound
- Outer sheath: TPE PUR
- Outer sheath: yellow (RAL 1023), black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
300 V (not for power applications)

Conductor resistance
1.5 mm²: max. 13.7 Ohm/km
2.5 mm²: max. 8.21 Ohm/km

Minimum bending radius
Fixed installation: 12 mm
Flexing without fixing: 24 mm
Flexing with fixing: 60 mm (15 x D)

Test voltage
Core/core: 2000 V

Temperature range
Fixed installation:
-40°C to +80°C (TPE +105°C)
Flexing without fixing:
-30 °C to +70 °C (TPE +105 °C)

Article number	Article designation	Outer sheath colour	Application	Number of cores and mm² per conductor	Copper index (kg/km)	Weight (kg/km)
For highly flexible applications (power chains, moving machine parts)						
2170357	UNITRONIC® BUS ASI FD P FRNC	yellow	Data and power transmission	2 x 1,5	29	64
2170358	UNITRONIC® BUS ASI FD P FRNC	black	Transmission of 30 V DC auxiliary power	2 x 1,5	29	64
2170317	UNITRONIC® BUS ASI LD FD P	yellow	Data and power transmission	2 x 2,5	48	74
2170318	UNITRONIC® BUS ASI LD FD P	black	Transmission of 30 V DC auxiliary power	2 x 2,5	48	74

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Lapp Kabel is a member of the AS-International Association
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® DIX-M AUTOMATION refer to main catalogue 2018/19
- AS-I clip clamp / AS-I end sealing refer to main catalogue 2018/19
- UNIVERSAL STRIP stripping tool refer to main catalogue 2018/19
- AS-I STRIP special stripping tool refer to main catalogue 2018/19
- AS-I STRIP special refer to main catalogue 2018/19
- SKINTOP® DIX ASI refer to main catalogue 2018/19

UNITRONIC® BUS PB

PROFIBUS cables for fixed applications

Info

- Lapp Kabel is a member of the PROFIBUS User Organisation (PNO)
- A for Advanced
  here: UL and CSA certifications

Application range

- For fixed installation
  Maximum electromagnetic screening
- Dry or damp rooms
- Item nos. 2170233, 2170333, 2170820, 2170824, 2170826 are all UV-resistant

Product features

- These bus cables can be used for PROFIBUS-DP as well as for PROFIBUS-FMS and FIP
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Norm references / Approvals

- In accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC NET, also suitable for FIP (Factory Instrumentation Protocol)
- See below for UL certification type

Product Make-up

- FC: Fast Connect cable design
- P: Polyurethane
  H: Halogen-free
- PE: polyethylene outer sheath, black
- 7-W: 7-wire, e.g. for applications where vibrations occur
- COMBI: Data transmission and power supply in one cable

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 186 Ohm/km.
see also datasheet

Minimum bending radius
Fixed installation: see data sheet

Test voltage
Core/core: 1500 V rms

Characteristic impedance
150 ± 15 Ohm

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Conventional cable makeup					
2170220	UNITRONIC® BUS PB	1 x 2 x 0.64	8	30.1	74
2170233	UNITRONIC® PB PE	1 x 2 x 0.64	8	30.1	57
2170226	UNITRONIC® BUS PB H 7-W	1 x 2 x 0.64	8	30.1	55
2170225	UNITRONIC® BUS PB COMBI 7-W	1 x 2 x 0,64 Ø + 3 x 1,0 mm²	9.8	59	92
Conventional cable makeup - UL/CSA CMX certification					
2170219	UNITRONIC® BUS PB A	1 x 2 x 0.64	8	30.1	57
Conventional cable makeup - UL/CSA CMG certification					
2170824	UNITRONIC® BUS PB 7-W A	1 x 2 x 0.64	8	30.1	55
Fast Connect					
2170333	UNITRONIC® BUS PB PE FC	1 x 2 x 0.64	8	26	67
Fast Connect - UL/CSA CMX certification					
2170330	UNITRONIC® BUS PB P FC	1 x 2 x 0.64	8	26	71
Fast Connect cable makeup - UL/CSA CMG certification					
2170820	UNITRONIC® BUS PB FC	1 x 2 x 0.64	8	26	84
2170826	UNITRONIC® BUS PB 7-W FC	1 x 2 x 0.64	8	26	67
2170326	UNITRONIC® BUS PB-H FC	1 x 2 x 0.64	8	26	72

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
SIMATIC NET® is a registered trademark of Siemens AG
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- UNITRONIC® BUS PB ROBUST refer to page 50
- UNITRONIC® BUS PB 105 refer to page 51

Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19
- SENSOR STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS PB TRAY

PROFIBUS cable with PLTC-ER approval for unprotected use on cable trays

Info

- PLTC-ER (power limited tray cable - epxosed run)

Benefits

- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP
- PLTC-ER approval for open wiring between cable tray and industrial machines/plants acc. to NEC 725.154 (D)
- No additional protection of the cable needed

Application range

- For fixed installation or applications with occasional movements
- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m
- UV-resistant UL SUN RES
- Flame retardant acc. UL 1685 - FT4 (vertical tray)

Norm references / Approvals

- C(UL)us Typ CMG (75°C) acc.to UL 444 / CSA 22.2
- UL Type PLTC-ER acc. to UL 13

Product Make-up

- Bare copper wire, 0,64 mm diameter
- Core colours: red, green
- Overall screening with copper braid and plastic-laminated aluminium foil
- PVC inner sheath and outer sheath
- Colour: violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(1 kHz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Impedance
150 +/- 15 Ohm

Conductor resistance
(loop): max. 110 ohm/km

Minimum bending radius
Fixed installation: 8 x outer diameter

Test voltage
Core/core: 2000 V

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -10°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS PB TRAY					
2170856	UNITRONIC® BUS PB TRAY	1x2x0,64	8.4	26	82

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
SIMATIC® is a registered trademark of SIEMENS AG. FIP is a registered trademark of World FIP
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19

UNITRONIC® BUS PB ROBUST

PROFIBUS cable - resistant to a wide range of chemical media

Info

- Excellent weather resistance
- Good chemical resistance

Benefits

- Robust PROFIBUS cable for use under harsh environmental conditions

Application range

- For use for PROFIBUS-DP or FIP in harsh industrial environments
- Fixed Installation

Product features

- Significantly extended use and application areas, water and chemical resistance for use in industrial conditions.
- High resistance to tensides, soaps etc.
- UV-resistant
- Flame-retardant according IEC 60332-1-2
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Product Make-up

- Solid and bare copper conductor
- Core insulation: cellular PE, O2Y(S)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: Specially formulated TPE, violet (RAL 4001)
- With conventional cable design

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(1 kHz): approx. 28.5 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Fixed installation: 75 mm

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V

Characteristic impedance
(3 - 20 MHz): 150 ± 15 Ohm

Temperature range
-40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
for fixed installation					
2170620	UNITRONIC® BUS PB ROBUST	1 x 2 x 0.64	8	26	55

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19

UNITRONIC® BUS PB 105

PROFIBUS cable with an extended temperature range up to +105°C

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
Approx. 28.5 nF/km

Peak operating voltage
max. 100 V (not for power applications)

Minimum bending radius
Fixed installation: 45 mm once
Flexing: 65 mm

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V

Characteristic impedance
(3 - 20 MHz): 150 ± 15 Ohm

Temperature range
-30°C to +105°C

Application range

- Cable has been designed for use in factory halls where temperatures up to max. 105°C may occur.

Product features

- High temperature resistance
- Flame-retardant according IEC 60332-1-2
- Oil-resistant

Product Make-up

- Stranded conductor, 7-wire, bare
- Conductor diameter: 0,64 mm (AWG24)
- Core insulation: PP
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: PVC, violet (RAL 4001)

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS PB 105					
2170630	UNITRONIC® BUS PB 105	1 x 2 x 0.64	8	30.1	72

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
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Accessories

- Multipurpose shears A and B refer to main catalogue 2018/19

UNITRONIC® BUS PB 105 plus

PROFIBUS cable with an extended temperature range up to +105°C; short term +120°C

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Fixed installation: 45 mm once
Flexing: 65 mm

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V eff.

Characteristic impedance
(3 - 20 MHz): 150 ± 15 Ohm

Temperature range
Fixed installation: -40°C to +105°C
Short-term: up to +120 °C

Benefits

- No need for additional cable protection against high temperatures
- High temperature resistance

Application range

- For installation in hollow shaft between gear units and pitch system
- Suitable for fixed installation and occasionally flexible use in high temperature areas

Product features

- Permanent load up to +105°C, temporary load +120°C

Norm references / Approvals

- In accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC NET, also suitable for FIP (Factory Instrumentation Protocol)

Product Make-up

- Stranded conductor, 7-wire, bare
- Core insulation: polypropylene (PP)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: TPE, violet (RAL 4001)

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)
UNITRONIC® BUS PB 105 plus				
2170635	UNITRONIC® BUS PB 105 plus	1x2x0,64	8	30.1

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UNITRONIC® BUS PB HEAT 180

PROFIBUS cable with an extended temperature range up to +180°C

Benefits

- No need for additional cable protection against high temperatures
- High temperature resistance

Application range

- Fixed Installation
- For use in high temperature areas with up to 180 °C

Product features

- High oil-resistance

Product Make-up

- Solid and bare copper conductor
- Wire insulation Fluorethylen
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: FEP, violet (RAL 4001)

Suitable connectors

- Sub-D Bus-Connectors refer to main catalogue 2018/19

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
approx. 28 nF / km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Repeated: 7 x Outer Diameter
Single: 5 x Outer Diameter

Test voltage
3600 V DC (3 sec.)

Characteristic impedance
(3 - 20 MHz): 150 ± 15 Ohm

Temperature range
-50 to +180°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS PB HEAT 180				
3031981	UNITRONIC® BUS PB HEAT 180	1 x 2 x 0,64	21.7	64.1

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
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UNITRONIC® BUS PB FRNC FC

FRNC PROFIBUS cable UL/CSA certified

Info

- FRNC = Flame Retardant Non Corrosive
  - Reduction of flame-propagation and density and toxicity of smoke gases in the event of fire
  - Minimisation of damage to buildings and production facilities
  - Safety for staff and in areas with high density of people

Benefits

- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP
- For use where the combination of a halogen-free outer sheath with properties similar to PUR and enhanced flame-retardance is required
- Fast Connect (FC) cable design

Application range

- This cable provides special advantages for use in sensitive areas where fire propagation must be avoided and the presence of toxic fumes would cause personal injury and damage to equipment.

Product features

- Halogen-free
- High flame retardancy in accordance with IEC 60332-3 and FT4
- Oil-resistant
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Norm references / Approvals

- UL/CSA-certified

Product Make-up

- Solid and bare copper conductor
- Core insulation: PE
- Inner sheath, screening foil and braiding
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Certifications
UL/CSA (CMG)

Mutual capacitance
Approx. 28.5 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
80 mm

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V

Characteristic impedance
(3 - 20 MHz): 150 ± 15 Ohm

Temperature range
-30°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Fixed Installation					
2170853	UNITRONIC® BUS PB FRNC FC	1 x 2 x 0.64	8	30.1	75

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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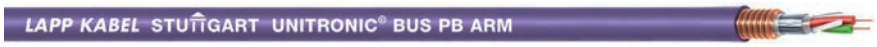
Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS PB ARM

Armored PROFIBUS cable for use in harsh industrial environments



Benefits

- EMC-optimised design

Application range

- For use for PROFIBUS-DP or FIP in harsh industrial environments
- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- Flame-retardant according IEC 60332-1-2
- UV-resistant

Product Make-up

- Solid and bare copper conductor
- Core insulation: cellular PE, O2Y(S)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Overlapping plastic tape
- Copper tape, welded longitudinally Outer sheath: PVC, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 100 V

Minimum bending radius
Fixed installation: 7.5 x outer diameter
Fixed installation: 3.5 x cable diameter once

Test voltage
3600 V DC (3 sec.)

Characteristic impedance
150 ± 15 Ohm

Temperature range
-40°C to +70°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS PB ARM					
2170247	UNITRONIC® BUS PB ARM	1 x 2 x 0.65	11.1	86.9	131

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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UNITRONIC® BUS PB Yv

PROFIBUS cable with reinforced PVC outer sheath for outdoor/direct burial use

Benefits

- Rugged, UV-resistant and weatherproof
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- Reinforced outer sheath made of PVC

Product Make-up

- Solid and bare copper conductor
- Foam Skin - core isolation (O2YS)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: reinforced PVC, black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Fixed installation: 75 mm once
Fixed installation: 150 mm

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -5°C to +50°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Suitable for outdoor use and direct burial					
2170223	UNITRONIC® BUS PB Yv	1 x 2 x 0.64	9.4	30.1	106

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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UNITRONIC® BUS PB YY

PROFIBUS cable with double PVC outer sheath for outdoor/direct burial use - Fast Connect cable make up

Benefits

- Rugged, UV-resistant and weatherproof
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- Double PVC outer sheath

Product Make-up

- Solid and bare copper conductor
- Core insulation: PE
- Overall screening with copper braid and plastic-laminated aluminium foil
- Inner sheath: PVC, violet RAL (4001), outer diameter: 7.4 mm
- Outer sheath, PVC, black RAL (9005), outer diameter: 9.5 mm

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Fixed installation: 75 mm once
Fixed installation: 10 x outer diameter

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -5°C to +50°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Suitable for outdoor use and direct burial					
2170236	UNITRONIC® BUS PB YY	1 x 2 x 0.64	9.5	30.1	87

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- Multipurpose shears A and B refer to main catalogue 2018/19

UNITRONIC® BUS PB BURIAL FC

PROFIBUS cable with double outer sheath for outdoor/direct burial use

Benefits

- Fast Connect (FC) cable design
- Rugged, UV-resistant and weatherproof
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- Second PE outer sheath

Product Make-up

- Solid and bare copper conductor
- Core insulation: foam skin, (O2YS)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Inner sheath: PVC, violet RAL (4001), outer diameter: 8.0 mm
- Outer sheath, PE, black RAL (9005), outer diameter: 10.8 mm

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 100 V

Minimum bending radius
Fixed installation: 3.5 x cable diameter once
Fixed installation: 7.5 x outer diameter

Test voltage
3600 V DC (3 sec.)

Characteristic impedance
150 ± 15 Ohm

Temperature range
-40 °C to +60 °C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Suitable for outdoor use and direct burial					
2170323	UNITRONIC® BUS PB BURIAL FC	1 x 2 x 0.64	10.8	26	115

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS PB Y 7-W FC BK

UV-resistant PROFIBUS cable for outdoor applications

Benefits

- Fast Connect (FC) cable design
- 7-W: 7-wire, e.g. for applications where vibrations occur
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- UV-resistant and weather-resistant
- Resistant to acids, alkalis and certain oils at room temperature

Product Make-up

- Stranded conductor, 7-wire, bare
- Core insulation: foam skin, (O2YS)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: PVC, black RAL (9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Fixed installation: 8 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -10°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS PB Y 7-W FC BK					
2170310	UNITRONIC® BUS PB Y 7-W FC BK	1 x 2 x 0.64	7.8	30.1	80

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS PB FD P

Halogenfree, highly flexible PROFIBUS cable

Benefits

- Due double screening it is suitable for installation in electromagnetically demanding areas
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP
- For use where the combination of a halogen-free outer sheath with properties similar to PUR and enhanced flame-retardance is required

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).
- For highly flexible applications (power chains, moving machine parts)
- Suitable for torsional applications which are typical for the loop in wind turbine generators (WTG)

Product features

- Halogen-free
- Flame-retardant according IEC 60332-1-2
- Oil-resistant
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Product Make-up

- Stranded bare copper wire
- Core insulation: foam skin, (O2YS)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Torsion movement in WTG (wind turbine generator)
TW-0 & TW-2, refer to Appendix T0

Minimum bending radius
65 mm

Test voltage
Core/core: 1500 V rms

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -30°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
For highly flexible applications (e.g. power chains) - conventional cable assembly					
2170222	UNITRONIC® BUS PB FD P	1 x 2 x 0.64	8	30.1	64

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19

UNITRONIC® BUS PB FD P A

Halogenfree, highly flexible PROFIBUS cable - UL/CSA certified

Info

- A for Advanced
  here: UL and CSA certifications

Benefits

- For use where the combination of a halogen-free outer sheath with properties similar to PUR and enhanced flame-retardance is required
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).
- For highly flexible applications (power chains, moving machine parts)
- Suitable for torsional applications which are typical for the loop in wind turbine generators (WTG)

Product features

- Halogen-free
- Flame-retardant according IEC 60332-1-2
- Oil-resistant
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Norm references / Approvals

- Certification: UL/CSA type CMX in accordance with UL 444 and CSA C22.2 no. 214

Product Make-up

- Stranded bare copper wire
- Core insulation: foam skin, (O2YS)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Torsion movement in WTG (wind turbine generator)
TW-0 & TW-2, refer to Appendix T0

Minimum bending radius
65 mm

Test voltage
Core/core: 1500 V rms

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -30°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Highly flexible application					
2170822	UNITRONIC® BUS PB FD P A	1 x 2 x 0.64	8	30.1	58

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19

UNITRONIC® BUS PB FD P FC

Halogenfree, highly flexible PROFIBUS cable - with fast connect cable make up, UL/CSA certified

Benefits

- Fast Connect (FC) cable design
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).
- For highly flexible applications (power chains, moving machine parts)

Product features

- Flame-retardant according IEC 60332-1-2
- Oil-resistant
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Norm references / Approvals

- Certification: UL/CSA type CMX in accordance with UL 444 and CSA C22.2 no. 214

Product Make-up

- Stranded bare copper wire
- Core insulation: foam skin, (O2YS)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Fast connect inner sheath: PVC, nature
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Flexing: 15 x outer diameter

Test voltage
3600 V DC (3 sec.)

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -30°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Highly flexible application					
2170322	UNITRONIC® BUS PB FD P FC	1 x 2 x 0.64	8	26	79

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS PB FD FRNC FC

Flame retardant, highly flexible PROFIBUS cable - with fast connect cable make up, UL/CSA certified

Benefits

- Fast Connect (FC) system
- For use where the combination of a halogen-free outer sheath with properties similar to PUR and enhanced flame-retardance is required
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- For highly flexible use in energy supply chains or permanently moving machines and linear robots
- This cable provides special advantages for use in sensitive areas where fire propagation must be avoided and the presence of toxic fumes would cause personal injury and damage to equipment.

Product features

- Halogen-free
- Oil-resistant
- High flame retardancy in accordance with IEC 60332-3 and FT4
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Norm references / Approvals

- The cable is UL/CSA-certified (CMG)

Product Make-up

- Stranded bare copper wire
- Core insulation: foam skin, (O2YS)
- Overall screening with copper braid and plastic-laminated aluminium foil
- Fast connect inner sheath: PVC, nature
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
nom. 28 nF/km

Peak operating voltage
(not for power applications) 250 V

Minimum bending radius
Fixed installation: 10 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
(3 - 20 MHz): 150 ± 15 Ohm

Temperature range
Flexing: -30°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS PB FD FRNC FC					
2170854	UNITRONIC® BUS PB FD FRNC FC	1x2x0,64	8	26	75

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS PB FD P COMBI

Highly flexible, halogenfree PROFIBUS HYBRID cables

UNITRONIC® BUS PB FD P HYBRID

Benefits

- For use where the combination of a halogen-free outer sheath with properties similar to PUR and enhanced flame-retardance is required
- For highly flexible applications (power chains, moving machine parts)
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- HYBRID: cable for data transmission + power supply
- Flame-retardant according IEC 60332-1-2

Product Make-up

UNITRONIC® BUS PB FD P COMBI

- Fine-wire, bare copper strand
- 1x2x0.64: red, green
  3x1.0 (AWG18): grenn/yellow, black, blue
- Core insulation: PE
- Tin-plated copper wire braiding
- Outer sheath: PUR, violet (RAL 4001)

UNITRONIC® BUS PB FD P HYBRID

- Fine-wire, bare copper strand
- 1x2x0.64 : red, green
  4 x 1.5 (AWG16): black with white numbers
- Core insulation: PE
- Tin-plated copper wire braiding
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications) 100 V

UNITRONIC® BUS PB FD P HYBRID
Flexing: 15 x outer diameter

Test voltage
UNITRONIC® BUS PB FD P COMBI
Core/core: 600 V
UNITRONIC® BUS PB FD P HYBRID
Core/core: 600 V
Core/screen: 600 V

Characteristic impedance
150 ± 15 Ohm

Temperature range
UNITRONIC® BUS PB FD P COMBI
Flexing: -5°C to +50°C
Fixed installation: -40°C to +80°C
UNITRONIC® BUS PB FD P HYBRID
Flexing: -30°C to +60°C
Fixed installation: -40°C to +70°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS PB FD P COMBI					
2170227	UNITRONIC® BUS PB FD P COMBI	1 x 2 x 0.64 Ø + 3 x 1.0 mm²	10.1	59	125
UNITRONIC® BUS PB FD P HYBRID					
2170495	UNITRONIC® BUS PB FD P HYBRID	1 x 2 x 0.64 Ø + 4 x 1.5 mm²	11.3	89	148

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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UNITRONIC® BUS PB FD Y HYBRID

Highly flexible PROFIBUS HYBRID cable, UL-verified

Benefits

- For highly flexible applications (power chains, moving machine parts)
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP
- CL3 for installation on trays

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- HYBRID: cable for data transmission + power supply

Norm references / Approvals

- With UL/CSA certification (CMG, CL3, SUN RES, Oil Res I)
- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- Oil-resistant according to UL OIL RES I

Product Make-up

- Fine-wire, bare copper strand
- 1x2x0.64: red, green
  Core insulation: Foam Skin PE
  4x1.5: black with white numbers 1-4
  Core insulation: PVC
- Tin-plated copper wire braiding
- Outer sheath: PVC, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
600 V (not for power applications)

Minimum bending radius
Fixed installation:
5 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 2000 V
Core/screen: 2000 V

Characteristic impedance
150 ± 15 Ohm

Temperature range
-5°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Highly flexible application					
2170875	UNITRONIC® BUS PB FD Y HYBRID	1 x 2 x 0.64 Ø + 4 x 1.5 mm²	11.3	89	155

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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UNITRONIC® BUS PB TORSION

Flame retardant, highly flexible PROFIBUS cable for torsion load

Benefits

- For use where the combination of a halogen-free outer sheath with properties similar to PUR and enhanced flame-retardance is required
- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- TORSION: for torsional stress, e.g. robot application; ± 180° per 1 m
- Halogen-free
- Flame-retardant according IEC 60332-1-2
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Norm references / Approvals

- Certification: UL type CMX in accordance with UL 444

Product Make-up

- Stranded bare copper wire
- Core insulation: PE
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
(not for power applications)
300 V

Torsion movement in WTG (wind turbine generator)
Max. torsion load
± 180°/m

Minimum bending radius
Fixed installation: 4 x outer diameter
Flexing: 7.5 x outer diameter

Test voltage
3600 V DC (3 sec.)

Characteristic impedance
150 ± 15 Ohm

Temperature range
Operating temperature: -25°C to 75°C
Storage temp.: -40°C to 80°C

Article number	Article designation	Number of cores and mm² per conductor	Dimension and cross section in mm2	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
Highly flexible application						
2170332	UNITRONIC® BUS PB TORSION	1 x 2 x 0.38	1 x 2 x 0.38	8	31	66

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19

UNITRONIC® BUS PB FESTOON

PROFIBUS cable for cable trolley applications

Benefits

- Cables can be used for PROFIBUS-DP as well as PROFIBUS-FMS and FIP
- CL3 for installation on trays

Application range

- PROFIBUS DP (in accordance with DIN 19245 and EN 50170, e.g. for SIEMENS SIMATIC® NET, also suitable for FIP - Factory Instrumentation Protocol).

Product features

- FESTOON: for cable trolley (festoon)
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Norm references / Approvals

- With UL/CSA certification (CMG, CL3, SUN RES, Oil Res I)
- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- Oil-resistant according to UL OIL RES I

Product Make-up

- Outer sheath: special PVC compound

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz): max. 30 nF/km

Peak operating voltage
600 V (not for power applications)

Minimum bending radius
Flexing: 70 mm
Fixed installation: 30 mm once

Test voltage
Core/core: 2000 V

Characteristic impedance
150 ± 15 Ohm

Temperature range
Flexing: -5°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of cores and mm² per conductor	Dimension and cross section in mm2	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
Highly flexible application						
2170331	UNITRONIC® BUS PB Festoon	1 x 2 x 0.64	1 x 2 x 0.64	8	26	64

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19

EPIC® DATA PB Sub-D

PROFIBUS connectors with screw terminals | REPEATER function | ATEX

Info

- Optional with LED diagnostic
- M12, REPEATER and ATEX version
- Versions with 2nd Sub-D interface

Benefits

- Easy connection with tried-and-tested M12 / screw terminal technology
- Sensor/ ac
- Terminating resistor (integrated) can be switched
- REPEATER version: Regeneration of data signal (slope, power and mark-to-space ratio)
- ATEX version: For use within intrinsically-safe circuits in zone 2 areas with an explosion hazard (explosive gas atmosphere occurs only rarely and briefly)

Product features

- Max. transmission rate 12 Mbit/s possible
- Current consumption max. 12,5 mA (with LED 35 mA / REPEATER 100 mA)
- Supply voltage 4.75 - 5.25 V DC (supplied from the terminal)
- Terminating resistor „ON“ - the outbound bus cable is disconnected
- REPEATER version: Easy extension of the PROFIBUS network:
  - up to 3 repeaters
  - 1 additional PROFIBUS segment
  - galvanic isolation

Norm references / Approvals

- IEC 61158, IEC 61784
- UL File No. E331560
- ATEX version: DIN EN 60079-0:2006, DIN 60079-15:2005 (category 3G zone 2)

Product Make-up

- D-Sub plug, 9-pin, fixing screws 4-40 UNC
- Improved electromagnetic compatibility (EMC) by metallized housing
- Versions with additional Sub-D interface for programming/diagnostic („PG“)
- For cable outer diameter: 5 8 mm / M12 B-coded cordsets
- LED Version indicate:
  bus operation - (green)
  station transmission - (blue)
  terminating resistor „on“ - (orange)

Suitable cables

- UNITRONIC® BUS PB Page 48
- UNITRONIC® BUS PB M12 Page 72
- UNITRONIC® BUS PB M12-M12 Page 72

Suitable tools

- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue 2018/19

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001132
ETIM 5.0/6.0 Class-Description:
D-Sub connector

Dimensions
54 mm x 40 mm x 17 mm - 35°
64 mm x 40 mm x 17 mm - 90°
68 mm x 40 mm x 17 mm - 180°
70 mm x 40 mm x 17 mm - M12
(LxWxH)

Connection type
Screwing
M12

Protection rating
IP 20

Terminating resistor
150 Ω

Interfaces
Sub-D socket, 9-pin
Terminal blocks up to 1.0 mm² /M12
B-coded

Permissble ambient conditions
Operating temperature: -25°C to +85°C
*The max. temperature for UL is 60 °C

Article number	Article designation	Version	PG-Interface	Diagnostic LEDs	PU
35° cable outlet					
21700507	ED-PB-35		no	no	1
21700506	ED-PB-35-PG		yes	no	1
90° cable outlet					
21700504	ED-PB-90		no	no	1
21700503	ED-PB-90-PG		yes	no	1
21700530	ED-PB-90-LED		no	yes	1
21700529	ED-PB-90-PG-LED		yes	yes	1
21700541	ED-PB-90-RP-PG	REPEATER	yes	yes	1
21700543	ED-PB-90-ATEX	ATEX	no	no	1
21700542	ED-PB-90-PG-ATEX	ATEX	yes	no	1
180° (AX) cable outlet					
21700505	ED-PB-AX		no	no	1

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EPIC® DATA PB Sub-D FC

PROFIBUS Connectors Fast Connect

Info

- New innovative insulation displacement terminals suitable for solid and flexible conductors (90° and 180° versions)
- Versions with 2nd Sub-D interface
- Optional with LED diagnostic

Benefits

- Quick installation with Fast Connect (‚FC') technology
- Sensor/ ac
- No loose parts
- Visual bus connection control
- Terminating resistor (integrated) can be switched

Product features

- Fully compatible with market standard
- Max. transmission rate 12 Mbit/s possible
- Current consumption max. 12,5 mA (with LED 35 mA)
- Supply voltage 4.75 - 5.25 V DC (supplied from the terminal)
- Terminating resistor „ON" - the outbound bus cable is disconnected

Norm references / Approvals

- IEC 61158, IEC 61784
- UL File No. E331560

Product Make-up

- D-Sub plug, 9-pin, fixing screws 4-40 UNC
- Improved electromagnetic compatibility (EMC) by metallized housing
- Max. cable outer diameter: 8 mm
- Versions with additional Sub-D interface for programming/diagnostic (‚PG')
- LED Version indicate:
  bus operation - (green)
  station transmission - (blue)
  terminating resistor „on" - (orange)

Suitable cables

- Bus system PROFIBUS-DP/FMS/FIP refer to main catalogue 2018/19

Suitable tools

- FC STRIP stripping tool refer to main catalogue 2018/19
- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue 2018/19

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001132
ETIM 5.0/6.0 Class-Description:
D-Sub connector

Dimensions
95 mm x 70 mm x 17 mm - 35°
72 mm x 40 mm x 17 mm - 90°
70 mm x 35 mm x 17 mm - 180°
(LxWxH)

Connection type
Fast Connect

Protection rating
IP 20

Terminating resistor
150 Ω

Interfaces
Sub-D socket, 9-pin
PROFIBUS FC standard cable,
Ø 0.64 mm

Permissble ambient conditions
Operating temperature: -25°C to +85°C
*The max. temperature for UL is 60 °C

Article number	Article designation	PG-Interface	Diagnostic LEDs	PU
35° cable outlet for solid conductor				
21700511	ED-PB-35-FC	no	no	1
21700513	ED-PB-35-PG-FC	yes	no	1
35° cable outlet for 7-/19-wire stranded conductor				
21700514	ED-PB-35-FC-FLEX	no	no	1
21700515	ED-PB-35-PG-FC-FLEX	yes	no	1
90° cable outlet for solid/ 7-/ 19-wire stranded conductor				
21700502	ED-PB-90-FC	no	no	1
21700501	ED-PB-90-PG-FC	yes	no	1
21700547	ED-PB-90-LED-FC	no	yes	1
21700546	ED-PB-90-PG-LED-FC	yes	yes	1
180° (AX) cable outlet for solid/ 7-/ 19-wire stranded conductor				
21700544	ED-PB-AX-FC	no	no	1

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EPIC® DATA PB Sub-D M12

PROFIBUS Connectors M12

Info

- Plug & Play together with ready-to-use PROFIBUS M12 cordsets

Benefits

- Cost-efficient due to quick installation (Plug & Play)
- Sensor/ ac
- No loose parts
- Terminating resistor (integrated) can be switched
- Suitable for assembled M12 PB cables

Product features

- Max. transmission rate 12 Mbit/s possible
- Current consumption max. 12,5 mA
- Supply voltage 4.75 - 5.25 V DC (supplied from the terminal)
- Switch can also be operated when the connector is plugged and setting is clearly visible
- Terminating resistor „ON“ - the outbound bus cable is disconnected

Norm references / Approvals

- IEC 61158, IEC 61784
- UL File No. E331560

Product Make-up

- D-Sub plug, 9-pin, fixing screws 4-40 UNC
- Connector M12, B-coded
- Improved electromagnetic compatibility (EMC) by metallized housing
- Version with additional Sub-D port for programming/diagnostic (‚PG‘)

Suitable cables

- UNITRONIC® BUS PB M12 Page 72
- UNITRONIC® BUS PB M12-M12 Page 72

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001132
ETIM 5.0/6.0 Class-Description:
D-Sub connector

Dimensions
70 mm x 40 mm x 17 mm (L x W x H)

Connection type
M12

Protection rating
IP 20

Terminating resistor
150 Ω

Interfaces
PROFIBUS station:
D-Sub socket, 9-pin
PROFIBUS cable:
M12 PB system cabling

Permissble ambient conditions
Operating temperature: -25°C to +85°C
*The max. temperature for UL is 60 °C

Article number	Article designation	Version	PG-Interface	Diagnostic LEDs	PU
EPIC® DATA PB Sub-D M12					
21700520	ED-PB-PG-90-M12	M12	yes	no	1

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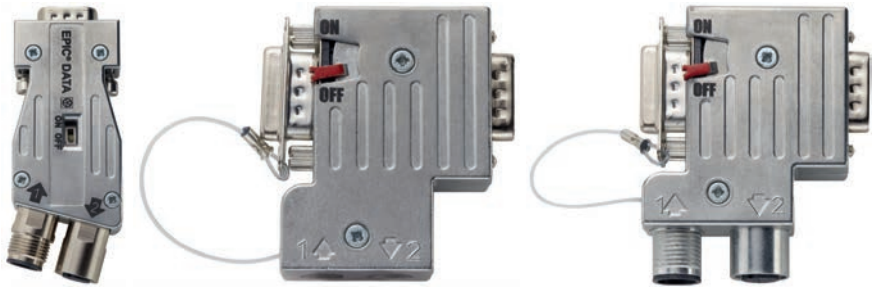
EPIC® DATA PB Sub-D PRO

PROFIBUS Connectors full-metall M12 connection /spring type connection



Info

- For high mechanical stress
- High EMC protection

Benefits

- Optimum EMC protection
- Robust housing material for harsh environments
- No loose parts
- Cost-efficient due to quick installation (Plug & Play)
- Terminating resistor (integrated) can be switched

Product features

- Extended temperature range
- High mechnical strength (200 contact durability)
- Less transmission loss
- Max. transmission rate 12 Mbit/s possible
- Supply voltage 4.75 - 5.25 V DC (supplied from the terminal)

Norm references / Approvals

- IEC 61158, IEC 61784

Product Make-up

- D-Sub plug, 9-pin, fixing screws 4-40 UNC
- 360° shielding due full-metall housing (ZnAl)
- With additional Sub-D port for programming/diagnostic ‚PG' (35° and 90° version)
- With EMC connector protection (PG port)
- M12 version: 5-pin connector, M12 B-coded

Suitable cables

- UNITRONIC® BUS PB M12 Page 72
- UNITRONIC® BUS PB M12-M12 Page 72

Suitable tools

- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue 2018/19

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001132
ETIM 5.0/6.0 Class-Description:
D-Sub connector

Dimensions
see technical data sheet

Connection type
M12 or
Internal spring type terminal

Protection rating
IP 30

Terminating resistor
150 Ω

Interfaces
Sub-D socket, 9-pin
Spring terminal for solid conductors / M12 B-coded
0,08 - 0,5 mm² (AWG28 - AWG14)
Cable diameter: 8 - 9 mm

Permissble ambient conditions
Operating temperature: -20°C to +70°C

Article number	Article designation	Connection type	PG-Interface	PU
EPIC® DATA PB Sub-D PRO				
21700563	ED-PB-AX-M12-PRO	M12	no	1
21700561	ED-PB-35-PG-M12-PRO	M12	yes	1
21700562	ED-PB-90-PG-M12-PRO	M12	yes	1
180° (AX) cable outlet				
21700566	ED-PB-AX-M12-PRO	Internal spring type	no	1
35° cable outlet				
21700564	ED-PB-35-PG-ST-PRO	Internal spring type	yes	1
90° cable outlet				
21700565	ED-PB-90-PG-ST-PRO	Internal spring type	yes	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA PB Sub-D FO

PROFIBUS Connectors Optical Link Modul

Info

- PROFIBUS repeater with integrated optical interface

Benefits

- Easy covering of large distances (PCF 250 m / POF 65 m)
- Cost-efficient due to quick installation (Plug & Play)
- Galvanic isolation in case of potential differences within PROFIBUS network
- For EMC critical environments
- Integrated repeater functionality: Regeneration of data signal (slope, power and mark-to-space ratio)

Product features

- Max. distance:
  POF fiber: 65 m
  PCF fiber: 250 m
- Diagnostic LEDs (blue, green, red, yellow)
- Bus termination is integrated
- Current consumption typ. 100 mA
- Supply voltage 5.0 V DC (supplied from the terminal)

Norm references / Approvals

- IEC 61158, IEC 61784

Product Make-up

- D-Sub plug, 9-pin, fixing screws 4-40 UNC
- Improved electromagnetic compatibility (EMC) by metallized housing
- Versions with additional Sub-D interface for programming/diagnostic (‚PG')
- An external 24 V supply is not necessary
- Connection for optical cable (POF or PCF)

Suitable cables

- HITRONIC® POF DUPLEX BUFFERED FIBRES Page 210
- HITRONIC® POF DUPLEX CABLE Page 211
- HITRONIC® POF cables for PROFINET Applications Page 212

Suitable connectors

- HBFR, SMA and BFOC(ST)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001132
ETIM 5.0/6.0 Class-Description: D-Sub connector

Dimensions
64 mm x 40 mm x 17 mm (LxWxH)

Protection rating
IP 20

Interfaces
Sub-D socket, 9-pin
Fibre optic cable: POF / PCF, 650 nm

Permissble ambient conditions
Operating temperature: 0°C to +60°C

Article number	Article designation	PG-Interface	Diagnostic LEDs	PU
90° cable outlet				
For HFBR connector				
21700568	ED-PB-90-PG-FO-HFBR-650	yes	yes	1
For SMA connector				
21700569	ED-PB-90-PG-FO-SMA-650	yes	yes	1
For BFOC(ST) connector				
21700570	ED-PB-90-PG-FO-BFOC-650	yes	yes	1

Applicable optical connectors (POF) included
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Note: For one optical link 2 modules are required

Accessories

- PCF Assembly Sets refer to main catalogue 2018/19
- PCF Connector HFBR refer to page 223
- PCF Connector F-SMA and ST(BFOC) refer to page 223
- POF Assembly Sets refer to page 216
- POF Connector F-SMA and ST(BFOC) refer to page 214
- POF Connector SC-RJ refer to page 215

UNITRONIC® BUS PB M12 / UNITRONIC® BUS PB M12-M12

PROFIBUS cable: M12 plug/socket on free conductor end

PROFIBUS Cable: M12 connector on M12 socket

Info

- Other types are available at www.lappgroup.com/assemblyfinder or on request

Benefits

- Cost efficient and rational wiring for PROFIBUS installations
- Space-saving due to compact dimensions
- Fast and easy error tracking

Application range

- Mechanical and plant engineering

Product features

- 2-core PROFIBUS cable, shielded
- Connector M12, B-coded with quick locking system
- Suitable for drag chains
- Including tag carrier

Norm references / Approvals

- UL-AWM-Style 21198 (80 °C / 300 V)

Product Make-up

- Core cross section: 0.25 mm2
- Core colours: red, green
- Outer sheath: PUR halogen-free, violett
- Outer diameter: 7.8 mm
- Shielded version
- Shielding is conducted over the knurl

Suitable connectors

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- EPIC® DATA PB M12 refer to page 73
- EPIC® DATA PB M12/M12 refer to page 74
- EPIC® DATA PB Sub-D M12 refer to page 69

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001855
ETIM 5.0/6.0 Class-Description: Sensor-actuator patch cord

Material
Contact: CuSn
Contact surface: Ni/Au
Knurl: Zinc die-cast, nickel-plated
Gripping body: TPU, flame-retardant, self-extinguishing

Protection rating
IP65/IP67

Ambient temperature (operation)
Plug/ socket: -25°C to +90°C
Fixed installation: -40°C to +80°C
Flexing: -30°C to +80°C
Drag chain application ≤ 70 °C

Coding
B - inverse

Rated current (A)
4 A

Article number	Article designation	Length (m)	Number of pins	Design	Rated voltage (V)	PU
Plug						
22260767	AB-PB-M12MS-2,0PUR	2	2	straight	250	1
22260768	AB-PB-M12MS-5,0PUR	5	2	straight	250	1
22260769	AB-PB-M12MS-10,0PUR	10	2	straight	250	1
22260956	AB-PB-M12MA-2,0PUR	2	2	angled	250	1
Socket						
22260770	AB-PB-2,0PUR-M12FS	2	2	straight	250	1
22260771	AB-PB-5,0PUR-M12FS	5	2	straight	250	1
Plug on socket						
22260955	AB-PB-M12MS-0,2PUR-M12FS	0.2	2	straight-straight	250	1
22260773	AB-PB-M12MS-0,3PUR-M12FS	0.3	2	straight-straight	250	1
22260774	AB-PB-M12MS-1,0PUR-M12FS	1	2	straight-straight	250	1
22260775	AB-PB-M12MS-2,0PUR-M12FS	2	2	straight-straight	250	1
22260869	AB-PB-M12MS-3,0PUR-M12FS	3	2	straight-straight	250	1
22260776	AB-PB-M12MS-5,0PUR-M12FS	5	2	straight-straight	250	1
22260777	AB-PB-M12MS-10,0PUR-M12FS	10	2	straight-straight	250	1
22260907	AB-PB-M12MS-15,0PUR-M12FS	15	2	straight-straight	250	1
22260908	AB-PB-M12MS-20,0PUR-M12FS	20	2	straight-straight	250	1
22260079	AB-PB-M12MA-5,0PUR-M12FA	5	2	angled-angled	250	1
22260904	AB-PB-M12MA-10,0PUR-M12FA	10	2	angled-angled	250	1

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: inclusive of copper. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- FLEXIMARK® Label LMB refer to main catalogue 2018/19

EPIC® DATA PB M12

Field mountable M12 BUS-connectors, shielded for PROFIBUS

Benefits

- Quick and easy on-site assembly
- For creating of individual cable lengths
- Cost efficient and rational wiring for BUS installations
- Space-saving due to compact dimensions

Product features

- Screened version
- Connector M12, B-coded
- PG9- / PG11-thread
- Screw connection

Suitable cables

- Bus system PROFIBUS-DP/FMS/FIP refer to main catalogue 2018/19
- UNITRONIC® BUS PB M12 Page 72

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Material
Contact: CuSn
Contact surface: Au
Contact carrier: PA66
Sealing: NBR
Knurl: Nickel-plated brass
Gripping body: Zinc die-cast, nickel-plated

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket -40°C to +85°C

Coding
B - inverse (PROFIBUS)

Rated current (A)
4 A

Article number	Article designation	Number of pins	Conductor cross-section (mm²)	Cable diameter in mm	Rated voltage (V)	PU
Plug, straight						
22260653	AB-C5-M12MSB-PG9-SH-AU	5	0.25 - 0.75	6.0 - 8.5	60	1
22262078	AB-C5-M12MSB-PG11-SH-AU	5	0.25 - 0.75	8.0 - 10.0	60	1
Socket, straight						
22260646	AB-C5-M12FSB-PG9-SH-AU	5	0.25 - 0.75	6.0 - 8.5	60	1
22260889	AB-C5-M12FSB-PG11-SH-AU	5	0.25 - 0.75	8.0 - 10.0	60	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA PB M12/M12

PROFIBUS M12 control cabinet feed-through, shielded

Benefits

- M12 connector on both sides
- Plug & Play for flexible connection solutions

Application range

- Mechanical and plant engineering

Product features

- For PROFIBUS applications
- Bipolar/screw mounting

Product Make-up

- 5-pin control cabinet feed-through, M12 B-coded
- M12 plug on M12 socket
- Screened version

Suitable cables

- UNITRONIC® BUS PB M12 Page 72
- UNITRONIC® BUS PB M12-M12 Page 72

Suitable connectors

- EPIC® DATA PB M12 refer to page 73

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002061
ETIM 5.0/6.0 Class-Description:
Sensor-actuator connector chassis

Material
Contact: CuZn
Contact surface: Au (gold)
Contact carrier: PA 66
Knurl: Nickel-plated brass
Sealing: FKM

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket
-25°C to +85°C

Coding
B - inverse (PROFIBUS)

Rated current (A)
4 A

Article number	Article designation	Number of pins	Rated voltage (V)	PU
Control cabinet feed through				
22262021	AB-C5-DSI-M12MSB-M12FSB-M16-SH	5	60	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA PB TR M12

M12 Terminating resistor for PROFIBUS

Benefits

- Cost efficient termination of a bus systems
- Space-saving due to compact dimensions
- Robust design

Application range

- Mechanical and plant engineering

Product features

- 150 Ω terminating resistor for PROFIBUS

Product Make-up

- Straight connector M12 with integrated termination resistor
- Straight connector M12, with integrated termination resistor, shielded

Info

- Fully suitable for industrial use

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000448
ETIM 5.0/6.0 Class-Description:
Terminal resistor

Protection rating
IP65/IP67 (plug)
IP 67 (socket)

Ambient temperature (operation)
-25°C to +90°C (plug)
-40°C to +85°C (socket)

Contact material
CuSn

Coding
B - inverse (PROFIBUS)

Rated current (A)
4 A

Article number	Article designation	Number of pins	Rated voltage (V)	PU
Plug, unshielded (terminating resistor)				
22260722	AB-C4-M12MS-PB-TR	4	60	5
Socket, shielded (terminating resistor)				
22261001	AB-C5-M12FS-PB-TR-SH	4	32	1

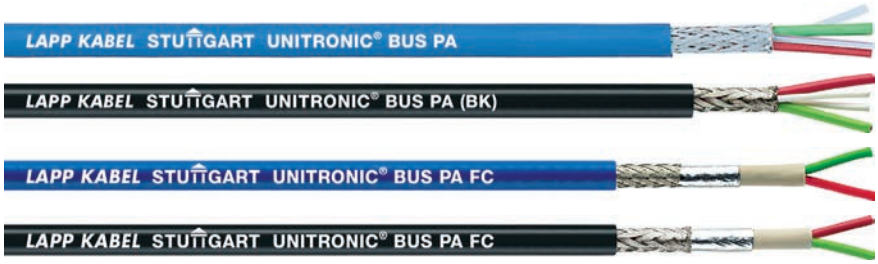
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

UNITRONIC® BUS PA

PROFIBUS cables for applications in manufacturing and process automation

Info

- PA = Process Automation
- Variant with UL/CSA CMG



Benefits

- FC (Fast Connect) version is oil and UV-resistant

Application range

- Process-automation application for connecting sensors and actuators - including areas with risks of explosion.
- Fixed Installation

Product features

- Bit rate = 31.25 kbit/s. Transmission technology RS485 also possible but bit rate is limited to 1.5 Mbit/s
- Maximum cable length is dependent on several factors (e.g. supply voltage, current demand).
- Technical Data: refer to the overview on „UNITRONIC® Bus Cables“
- Flame-retardant according IEC 60332-1-2

Norm references / Approvals

- PROFIBUS® PA is standardised in EN 50170 as PROFIBUS® DP and PROFIBUS® FMS
- Transmission technology for PROFIBUS-PA in accordance with international standard IEC 61158-2
- FC variant with UL/CSA certification (CMG / PLTC)

Product Make-up

- UNITRONIC® BUS PA
  Stranded conductor
  Copper braiding
  Outer sheath: PVC, blue, (RAL 5015)
  intrinsically safe area, black (RAL 9005)
- UNITRONIC® BUS PA FC
  Bare copper wire
  Fast Connect inner sheath
  Cu-Geflecht
  Puter sheath: PVC, blue (RAL 5015), black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 44 ohm/km

Minimum bending radius
Fixed installation: 10 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
100 ± 20 Ohm

Temperature range
Fixed installation: -30°C to +80°C
During installation: -5°C to +50°C

Article number	Article designation	Number of pairs and cable diameter per conductor in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Conventional cable makeup					
2170234	UNITRONIC® BUS PA (BU)	1 x 2 x 1,3	8	45	84
2170235	UNITRONIC® BUS PA (BK)	1 x 2 x 1,3	8	45	84
Fast Connect cable makeup - UL/CSA CMG certification					
2170334	UNITRONIC® BUS PA FC (BU)	1 x 2 x 1.00	8	45.5	103
2170335	UNITRONIC® BUS PA FC (BK)	1 x 2 x 1.00	8	45.5	103

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
SIMATIC® is a registered trademark of Siemens AG
Armoured
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Multipurpose shears A and B refer to main catalogue 2018/19
- STAR STRIP stripping tool refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® DeviceNet THICK + THIN

DeviceNet Buscable based on the CAN technology

Application range

- Fixed Installation
- DeviceNet™ connects industrial devices e.g. limit switches, photoelectric switches, valve islands, motor starters, drives, PLCs, etc.

Product features

- Resistant to oils
- Based on proven CAN (Controller Area Network) technology.
- Permissible cable lengths vary with the data rate and the cable thickness
- FRNC Version: Halogene free and flame retardant
- Refer to data sheet for more details

Norm references / Approvals

- CMG UL/CSA certification 75°C or PLTC, Sun Res
- FRNC variant additionally with Germanischer Lloyd certification

Product Make-up

- Tinned copper wire
- Core insulation: foam skin
- Tinned-copper braiding with drain wire
- Outer sheath: FRNC or PVC

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Core identification code
Data pair: light blue + white
Power supply: red + black

Mutual capacitance
(800 Hz): max. 39.8 nF/km

Peak operating voltage
300 V (not for power applications)

Conductor resistance
Thick (loop): max. 45 ohm/km
Thin (loop): max. 180 ohm/km

Minimum bending radius
Fixed installation: 15 x outer diameter

Test voltage
Core/core: 2000 V

Characteristic impedance
120 ohm

Temperature range
Fixed installation: -25°C to +80°C

Article number	Article designation	Number of pairs and AWG size	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
Halogen-free					
2170340	UNITRONIC® BUS DN THICK FRNC	1x2xAWG18 + 1x2xAWG15	12.2	82.8	195
2170341	UNITRONIC® BUS DN THIN FRNC	1x2xAWG24 + 1x2xAWG22	6.9	33.4	69.5
PVC					
2170342	UNITRONIC® BUS DN THICK Y	1x2xAWG18 + 1x2xAWG15	12.2	88.4	192
2170343	UNITRONIC® BUS DN THIN Y	1x2xAWG24 + 1x2xAWG22	6.9	33.4	66.9

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
FRNC means Flame-Retardant, Non-Corrosive; and DeviceNet is a registered trademark of ODVA.
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
ECO is the cost-efficient version of article no. 2170342 and 2170343, with a slight modification to the outer sheath and UL/CSA-approved (CMG).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

DeviceNet

UNITRONIC® DeviceNet FD THICK+THIN

High flexible DeviceNet Buscable based on the CAN technology

Application range

- For highly flexible applications
- DeviceNet™ connects industrial devices e.g. limit switches, photoelectric switches, valve islands, motor starters, drives, PLCs, etc.

Product features

- Based on proven CAN (Controller Area Network) technology.
- Permissible cable lengths vary with the data rate and the cable thickness
- Refer to data sheet for more details
- PUR (P) Version: Halogene free
  PVC (Y) Version: Flame retardant (UL FT4)
- UV-resistant (but colour may change after some time)

Norm references / Approvals

- PUR: UL/CSA-certified (CMX)
- PVC: UL/CSA CMG 75°C FT4 Sun Res Oil Res, at 2170346 also PLTC

Product Make-up

- Core insulation: PE
- Outer sheath of Polyurethan (PUR) or Polyvinylchlorid (PVC)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Core identification code
Data pair: light blue + white
Power supply: red + black

Mutual capacitance
(800 Hz): max. 39.8 nF/km

Peak operating voltage
300 V (not for power applications)

Conductor resistance
Thick (loop): max. 45 ohm/km
Thin (loop): max. 180 ohm/km

Minimum bending radius
Fixed installation: 7.5 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 2000 V

Characteristic impedance
120 ohm

Temperature range
PUR: -40°C to +80°C
PVC: -10°C to +80°C

Article number	Article designation	Number of pairs and AWG size	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
PUR					
2170344	UNITRONIC® BUS DN THICK FD P	1x2xAWG18 + 1x2xAWG15	12.2	94	184
2170345	UNITRONIC® BUS DN THIN FD P	1x2xAWG24 + 1x2xAWG22	6.9	33.4	67.7
PVC					
2170346	UNITRONIC® BUS DN THICK FD Y	1x2xAWG18 + 1x2xAWG15	12.2	94	195
2170347	UNITRONIC® BUS DN THIN FD Y	1x2xAWG24 + 1x 2xAWG22	6.9	33.4	69.8

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
DeviceNet is a registered trademark of ODVA
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- SMART STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS CAN

CAN Buscables for fixed installation - UL/SCA certified

Info

- CAN = Controller Area Network

UNITRONIC® BUS CAN FD P

CAN Buscables for high flexible application - UL/SCA certified

Application range

UNITRONIC® BUS CAN

- Fixed Installation

UNITRONIC® BUS CAN FD P

- For highly flexible applications

Product features

UNITRONIC® BUS CAN

- Maximum bit rate: 1 Mbit/s for 40 m segment length
- Larger conductor cross-section is necessary with increasing length. Refer to the table below (reference values from ISO 11898).
- ISO 11898 makes recommendations for the segment length, cable cross section and bit rate
- Flame-retardant according IEC 60332-1-2

UNITRONIC® BUS CAN FD P

- Halogen-free
- Maximum bit rate: 1 Mbit/s for 40 m segment length
- Larger conductor cross-section is necessary with increasing length. Refer to the table below (reference values from ISO 11898).
- ISO 11898 makes recommendations for the segment length, cable cross section and bit rate
- Flame-retardant according IEC 60332-1-2

Norm references / Approvals

- Standardised internationally in ISO 11898
- UL/CSA type CMX (UL 444)

Product Make-up

UNITRONIC® BUS CAN

- 0.22 + 0.34 + 0.5: bare stranded conductor, 7-wire
  0.75: bare stranded conductor, fine-wire
- Core insulation: foam skin
- Colour-coded in accordance with DIN 47100
- Copper braid
- Outer sheath: PVC, violet (RAL 4001)

UNITRONIC® BUS CAN FD P

- Stranded bare conductor
- Core insulation: foam skin
- Copper braid
- Outer sheath: PUR, violet (RAL 4001)
- UV-resistant (but colour may change after some time)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz) max. 40 nF/km

Peak operating voltage
UNITRONIC® BUS CAN
(not for power applications) 250 V
UNITRONIC® BUS CAN FD P
250 V (not for power transmission)

Conductor resistance
UNITRONIC® BUS CAN
(loop): max. 186 ohm/km
UNITRONIC® BUS CAN FD P
(loop): max. 159.8 ohm/km

Minimum bending radius
UNITRONIC® BUS CAN
Fixed installation: 8 x outer diameter
UNITRONIC® BUS CAN FD P
Flexing: 15 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
120 ohm

Temperature range
UNITRONIC® BUS CAN
Fixed installation: -30°C to +80°C
Flexing: -5°C to +70°C
UNITRONIC® BUS CAN FD P
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C

Article number	Article designation	Number of pairs/conductor cross section (mm²)	Outer diameter [mm]	Conductor resistance	Copper index (kg/km)	Weight (kg/km)
for fixed installation						
2170260	UNITRONIC® BUS CAN	1 x 2 x 0,22	5.7	186	16.7	42
2170261	UNITRONIC® BUS CAN	2 x 2 x 0,22	7.6	186	34.8	68
2170263	UNITRONIC® BUS CAN	1 x 2 x 0,34	6.8	115	25	55
2170264	UNITRONIC® BUS CAN	2 x 2 x 0,34	8.5	115	46.4	88
2170266	UNITRONIC® BUS CAN	1 x 2 x 0,5	7.5	78	41.6	90
2170267	UNITRONIC® BUS CAN	2 x 2 x 0,5	9.6	78	59.4	106
2170269	UNITRONIC® BUS CAN	1 x 2 x 0,75	8.7	52	52.7	108
2170270	UNITRONIC® BUS CAN	2 x 2 x 0,75	11.5	52	80.6	142
For highly flexible applications (power chains, moving machine parts)						
2170272	UNITRONIC® BUS CAN FD P	1 x 2 x 0,25	6.4	159.8	24	40
2170273	UNITRONIC® BUS CAN FD P	2 x 2 x 0,25	8.4	159.8	33	65
2170275	UNITRONIC® BUS CAN FD P	1 x 2 x 0,34	6.8	122	32.8	60
2170276	UNITRONIC® BUS CAN FD P	2 x 2 x 0,34	9.6	122	52.4	88
2170278	UNITRONIC® BUS CAN FD P	1 x 2 x 0,5	8	72.8	41.9	74
2170279	UNITRONIC® BUS CAN FD P	2 x 2 x 0,5	10.8	72.8	59.4	100

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Multipurpose shears A and B refer to main catalogue 2018/19
- SENSOR STRIP stripping tool refer to main catalogue 2018/19
- SMART STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS CAN TRAY

CAN Bus cable with PLTC-ER approval - for open wiring between cable trays and industrial machines

Info

- CAN = Controller Area Network

Benefits

- PLTC-ER approval for open wiring between cable tray and industrial machines/plants acc. to NEC 725.154 (D)
- No additional protection of the cable needed

Application range

- Fixed Installation

Product features

- Maximum bit rate: 1 Mbit/s for 40 m segment length
- ISO 11898 makes recommendations for the segment length, cable cross section and bit rate
- UV-resistant UL SUN RES
- Oil-resistant according to UL OIL RES I
- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test

Norm references / Approvals

- Standardised internationally in ISO 11898
- C(UL)us Typ CMG (75°C) acc.to UL 444 / CSA 22.2
- UL Type PLTC-ER acc. to UL 13

Product Make-up

- 7-wire bare stranded copper conductor
- Core insulation: foam skin
- Inner sheath: PVC
- Copper braid
- Outer sheath: PVC, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz) max. 40 nF/km

Peak operating voltage
(not for power applications) 250 V
Rated voltage: 600 V (UL)

Conductor resistance
(loop): max. 110,8 ohm/km

Minimum bending radius
Fixed installation: 8 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 2000 V

Characteristic impedance
120 ohm

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -10°C to +70°C

Article number	Article designation	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
UNITRONIC® BUS CAN TRAY					
2170857	UNITRONIC® BUS CAN TRAY	2 x 2 x 0,34	7.5	35	81

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Multipurpose shears A and B refer to main catalogue 2018/19
- SMART STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS CAN BURIAL

CAN bus cable with double outer sheath for outdoor/direct burial use

Info

- Suitable for direct burial

Benefits

- Suitable for CAN communication according to ISO 11898
- Double-sheathed version, extremely tough, for installation without corrugated tubing
- Rugged, UV-resistant and weatherproof
- Diameter of inner sheath suitable for common connectors

Application range

- Useable for CAN based communication systems like CANopen
- Suitable for direct burial
- For outdoor applications
- For fixed installation or applications with occasional movements

Product Make-up

- Copper stranded 7x0,32
- Core insulation: PE
- Overall screening of braided tinned-copper strands
- Inner sheath: PVC, violet RAL (4001), outer diameter: 7.1 mm
- Outer sheath: PE, black RAL (9005), outer diameter: 9.0 mm

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(1 kHz): max. 40 nF/km

Peak operating voltage
300 V (not for power applications)

Conductor resistance
(Loop): max. 74 Ohm /km

Minimum bending radius
Flexible use: 8 x Outer Diameter
Fixed Installation: 4 x Outer Diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
120 ohm

Temperature range
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
UNITRONIC® BUS CAN BURIAL				
2170500	4 x 1 x 0,5	9	41.8	91

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Sub-D Bus-Connectors refer to main catalogue 2018/19

CANopen

UNITRONIC® BUS HEAT 6722

CAN bus cable for utility vehicles

Info

- Designed according to ISO 6722
- Tested acc.to ECE-R 118.01

Benefits

- Extended temperature range
- Good resistance to oil, petrol, acids and alkalis

Application range

- Suitable for connecting to of e.g. camera systems, enter-/ infotainment for passengers, ticketing systems
- For fixed, occassionally flexible and protected use inside of utility vehicles

Product features

- Halogen-free outer sheath
- Maximum bit rate: 1 Mbit/s for 40 m segment length
- Temperature class B on the basis of ISO 6722-1
- ISO 11898 makes recommendations for the segment length, cable cross section and bit rate
- Flame-retardant according IEC 60332-1-2

Norm references / Approvals

- Standardised internationally in ISO 11898

Product Make-up

- Stranded bare conductor
- PUR outer sheath
- Colour: black
- UV-resistant (but colour may change after some time)
- Screening: wrapped with braided copper wires

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
40 nF/km (800 Hz)

Peak operating voltage
250 V (not for power transmission)

Conductor resistance
(loop): max. 159.8 ohm/km

Minimum bending radius
Flexing: 15 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
120 ohm

Temperature range
Fixed installation: -40°C to +105°C
occasionally flexing: -30°C to +105°C

Article number	Article designation	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
UNITRONIC® BUS HEAT 6722					
2170385	UNITRONIC® BUS HEAT 6722	1 x 4 x 0,25	6.45	26	46
2170386	UNITRONIC® BUS HEAT 6722	1 x 4 x 0,34	7.54	33	61
2170387	UNITRONIC® BUS HEAT 6722	1 x 4 x 0,5	8.36	41	70
2170388	UNITRONIC® BUS HEAT 6722	1 x 4 x 0,75	9.79	59	95

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Multipurpose shears A and B refer to main catalogue 2018/19
- SENSOR STRIP stripping tool refer to main catalogue 2018/19
- SMART STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® TRAIN

Bus cables - MVB and WTB - Electron beam cross-linked for high requirements in railway applications

Info

- Small outer diameters for maximum saving of space and weight
- Extremely low attenuation ≤ 5 MHz

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increases the protection against damage to persons and property in the event of a fire
- EMC-optimised design

Application range

- The communication systems WTB (wire train bus) and MVB (multifunction vehicle bus) make up the so-called TCN (train communication network)
- UNITRONIC® TRAIN bus cables are designed for use in TCN acc. IEC 61375
  MVB according IEC 61375-3-1
  WTB according IEC 61375-2-1
- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
  - Halogen-free acc. to EN 60754-1
  - No corrosive gases acc. to EN 60754-2
  - No fluorine acc. to EN 60684-2
  - No toxic gases acc. to EN 50305
  - Low smoke density acc. to EN 61034-2
  - Flame-retardant acc. to EN 60332-1-2
  - No flame propagation acc. to EN 60332-3-25
- Fire behaviour according to NF:
  - Toxicity of gases acc. to NF X 70-100
  - Low smoke density acc. to NF X 10-702
  - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
  - Oil resistant acc. to EN 50264-1
  - Fuel resistant acc. to EN 50264-1
  - Acid resistant acc. to EN 50264-1
  - Alkali resistant acc. to EN 50264-1
  - Ozone resistant acc. to EN 50264-3-2

Norm references / Approvals

- EN 45545-2 HL1, HL2, HL3
- EN 50264-1

Product Make-up

- Stranded tinned 19-wire conductor
- Core insulation: Based on Polyolefin
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Flexing: 10 x outer diameter
Fixed installation: 6 x outer diameter

Test voltage
Core/core: 1000 V
Core/screen: 1000 V

Characteristic impedance
120 ohm (±10%)

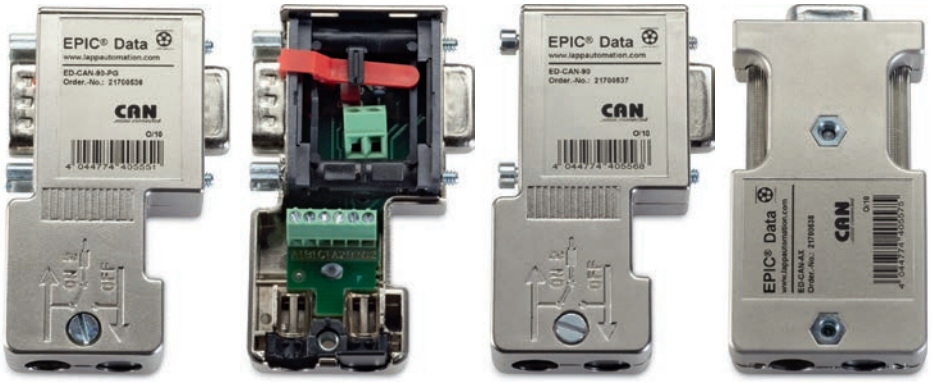
Temperature range
Fixed installation:
-45°C to +90°C
Occasional flexing: -35°C up to +90°C

Article number	Article designation	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)
Cables for MVB				
2173000	UNITRONIC® TRAIN MVB 1x2x0,5	1x2x0,5	7.6	29
2173001	UNITRONIC® TRAIN MVB 1x2x0,5+1x0,5	1x2x0,5+1x0,5	7.6	34
2173002	UNITRONIC® TRAIN MVB 2x2x0,5	2x2x0,5	8.3	40
2173003	UNITRONIC® TRAIN MVB 2x2x0,5+4x0,25	2x2x0,5+4x0,25	8.3	50
Cables for WTB				
2173004	UNITRONIC® TRAIN WTB 1x2x0,75	1x2x0,75	8.4	41

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA CAN Sub-D

CAN Bus-Connectors with screw connection



Benefits

- Terminating resistor (integrated) can be switched
- Sensor/ ac
- No loose parts
- With additional 24 V DC output to supply external devices (90° version only)

Product features

- Max. transmission rate 1 Mbit/s possible
- Terminating resistor „ON“ - the outbound bus cable is disconnected
- The integrated, connectable terminating resistor
  enable the CAN-Bus to be terminated or connected through
- Sub-D pin assignment:
  CAN Low = Pin 2
  CAN High = Pin 7
  CAN Gnd = Pin 3
  GND = Pin 6 (90° version only)
  CAN V+ = Pin 9 (90° version only)
  (shield = housing)

Norm references / Approvals

- UL File No. E331560

Product Make-up

- D-Sub plug, 9-pin, fixing screws 4-40 UNC
- Screw connection
- Improved electromagnetic compatibility (EMC) by metallized housing
- For cable outer diameter: 5 - 8 mm

Suitable cables

- Bus system CAN / DeviceNet refer to main catalogue 2018/19

Suitable tools

- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue 2018/19

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001132
ETIM 5.0/6.0 Class-Description:
D-Sub connector

Dimensions
60 mm x 40 mm x 17 mm - 90°
67,5 mm x 35 mm x 17 mm - 180°
(LxWxH)

Connection type
Screwing

Protection rating
IP 20

Terminating resistor
120 Ω

Interfaces
CAN bus station:
D-Sub socket, 9-pin
CAN bus cable:
6 terminal blocks for wires up to 0.8 mm²

Permissble ambient conditions
Operating temperature: -25°C to +85°C
*The max. temperature for UL is 60 °C

Article number	Article designation	Cable outlet	PG-Interface	PU
Sub-D connector				
21700537	ED-CAN-90	90°	no	1
21700536	ED-CAN-90-PG	90°	yes	1
21700538	ED-CAN-AX	180° axial	no	1

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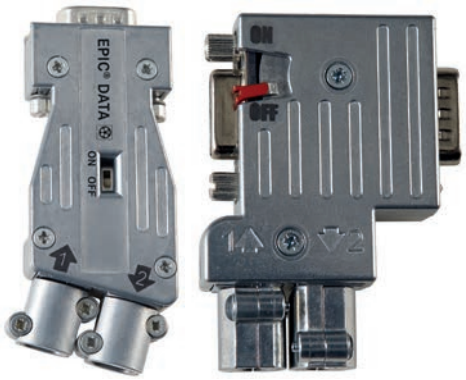
DeviceNet CANopen

EPIC® DATA CAN Sub-D PRO

CAN Bus-Connectors full-metall



Info

- High EMC protection
- For cable diameters up to 10 mm

Benefits

- High flexibility by extended cable clamping range
- Cost-saving due to quick and easy installation
- Robust housing material for harsh environments
- For EMC critical environments

Product features

- Extended temperature range
- High mechnical strength (200 contact durability)
- Less transmission loss
- Bus termination is integrated
- Sub-D pin assignment:
  CAN Low = Pin 2
  CAN High = Pin 7
  CAN Gnd = Pin 3
  GND = Pin 6 (90° version only)
  CAN V+ = Pin 9 (90° version only)
  (shield = housing)

Product Make-up

- D-Sub plug, 9-pin, fixing screws 4-40 UNC
- 360° shielding due full-metall housing (ZnAl)
- External cable clamp connection (7-10 mm)
- 90° version: With additional Sub-D port for programming/diagnostic (‚PG')
- 90° version: PG port with undetachable EMC Sub-D protection

Suitable cables

- UNITRONIC® DeviceNet THICK + THIN Page 76
- UNITRONIC® BUS CAN Page 78
- UNITRONIC® DeviceNet FD THICK+THIN Page 77
- UNITRONIC® BUS CAN FD P Page 78
- UNITRONIC® BUS CAN TRAY Page 79
- UNITRONIC® BUS HEAT 6722 Page 81
- UNITRONIC® BUS CAN BURIAL Page 80

Suitable tools

- Kraftform® adjustable torque screwdriver/ Kraftform Kompakt® Set refer to main catalogue 2018/19

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001132
ETIM 5.0/6.0 Class-Description:
D-Sub connector

Dimensions
63 x 45 x 18 - 90°
81 x 36 x 15 - 180°
(LxWxH)

Connection type
Screwing

Protection rating
IP 30

Terminating resistor
120 Ω

Interfaces
CAN-Bus station:
D-SUB socket, 9-pin
CAN-Bus cable:
- srew terminals for wires 0.14 - 0.5 mm²

Permissble ambient conditions
Operating temperature: -20°C to +70°C

Article number	Article designation	Cable outlet	PG-Interface	PU
Sub-D connector				
21700590	ED-CAN-90-PG-PRO	90°	yes	1
21700591	ED-CAN-AX-PRO	180° axial	no	1

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DeviceNet CANopen

UNITRONIC® BUS CAN M12 / UNITRONIC® BUS CAN M12-M12

DeviceNet/CANopen Cable: M12 plug/socket on free conductor end

Info

- Other types are available at www.lappgroup.com/assemblyfinder or on request

Benefits

- Cost-effective, efficient wiring of fieldbus and sensor/ actuator installations
- Space-saving due to compact dimensions
- Fast and easy error tracking
- Robust design

Application range

- Mechanical and plant engineering

Product features

- 5-core DeviceNet/CANopen cable, shielded
- M12 connector, A-coded with quick-locking system
- Suitable for drag chains
- Including tag carrier

Norm references / Approvals

- UL-AWM-Style 21198 (80 °C / 300 V)

Product Make-up

- Signal line: 2 x 0.25 mm²
  Power supply: 2 x 0.34 mm²
  Drain wire: 1 x 0.34 mm²
- Core colours: red/black, blue/white
- Outer sheath: PUR halogen-free, violett
- Outer diameter: 6.7 mm
- Shielded version

Suitable connectors

- Sub-D Bus-Connectors refer to main catalogue 2018/19
- EPIC® DATA CAN M12 Page 86
- EPIC® DATA CAN M12/M12 Page 86
- EPIC® DATA CAN TR M12 Page 87
- EPIC® DATA CAN M12T Page 88
- EPIC® DATA CAN CCR Page 88

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001855
ETIM 5.0/6.0 Class-Description: Sensor-actuator patch cord

Material
Contact: CuSn
Contact surface: Ni/Au
Knurl: Zinc die-cast, nickel-plated
Gripping body: TPU, flame-retardant, self-extinguishing

Protection rating
IP65/IP67

Ambient temperature (operation)
Plug/ socket: -25°C to +90°C
Fixed installation: -40°C to +80°C
Flexing: -20°C to +80°C
Drag chain application: 70°C

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Length (m)	Number of pins	Design	Rated voltage (V)	PU
Plug						
22260789	AB-DN-M12MS-2,0PUR	2	5	straight	60	1
22260790	AB-DN-M12MS-5,0PUR	5	5	straight	60	1
22260791	AB-DN-M12MS-10,0PUR	10	5	straight	60	1
22262004	AB-DN-M12MA-2,0PUR	2	5	angled	60	1
Socket						
22260792	AB-DN-2,0PUR-M12FS	2	5	straight	60	1
22260793	AB-DN-5,0PUR-M12FS	5	5	straight	60	1
22260794	AB-DN-10,0PUR-M12FS	10	5	straight	60	1
Plug on socket						
22260795	AB-DN-M12MS-0,3PUR-M12FS	0.3	5	straight-straight	60	1
22260796	AB-DN-M12MS-1,0PUR-M12FS	1	5	straight-straight	60	1
22260797	AB-DN-M12MS-2,0PUR-M12FS	2	5	straight-straight	60	1
22260798	AB-DN-M12MS-5,0PUR-M12FS	5	5	straight-straight	60	1
22260799	AB-DN-M12MS-10,0PUR-M12FS	10	5	straight-straight	60	1

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: inclusive of copper. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- FLEXIMARK® Label LMB refer to main catalogue 2018/19

EPIC® DATA CAN M12

Field mountable M12 BUS-connectors shielded for DeviceNet/CANopen

Benefits

- Quick and easy on-site assembly
- For creating of individual cable lengths
- Cost efficient and rational wiring for BUS installations
- Space-saving due to compact dimensions

Product Make-up

- M12 plug, 5-pins, A-coded
- Screw connection
- PG9 thread
- Screened version

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Connection type
Screwing

Material
Contact: CuSn
Contact surface: Au
Contact carrier: PA66
Sealing: NBR
Knurl: Nickel-plated brass
Gripping body: Zinc die-cast, nickel-plated

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket -40°C to +85°C

Coding
A - Standard
(CANopen/DeviceNet/CC-Link)

Rated current (A)
4 A

Article number	Article designation	Design	Number of pins	Cross-section in mm²	Cable diameter in mm	Rated voltage (V)	PU
Plug, straight							
22260135	AB-C5-M12MS-PG9-SH	screw	5	0.25 - 0.75	6.0 - 8.0	60	1
Socket, straight							
22260136	AB-C5-M12FS-PG9-SH	screw	5	0.25 - 0.75	6.0 - 8.0	60	1

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EPIC® DATA CAN M12/M12

M12 control cabinet feed-through, shielded for CAN/DeviceNet/ S/A cabling

Benefits

- M12 connector on both sides
- Plug & Play for flexible connection solutions

Product features

- For CANopen/DeviceNet applications
- For sensor/actuator cabling
- Bipolar/screw mounting

Product Make-up

- 5-pin control cabinet feed-through, M12 A-coded
- M12 plug on M12 socket
- Screened version

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002061
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector chassis

Material
Contact: CuZn
Contact surface: Au (gold)
Contact carrier: PA 66
Knurl: Nickel-plated brass
Sealing: FKM

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket
-25°C to +85°C

Coding
A - Standard
(CANopen/DeviceNet/CC-Link)

Rated current (A)
4 A

Article number	Article designation	Number of pins	Rated voltage (V)	PU
Control cabinet feed through				
22262020	AB-C5-DSI-M12MS-M12FS-M16-SH	5	24	1

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DeviceNet CANopen

EPIC® DATA CAN TR M12

M12 Terminating resistor for DeviceNet/CANopen

Info

- Fully suitable for industrial use

Benefits

- Cost efficient termination of a bus systems
- Space-saving due to compact dimensions
- Robust design

Application range

- Mechanical and plant engineering

Product features

- 120 Ω terminating resistor for DeviceNet/ CANopen

Product Make-up

- Straight connector M12 with integrated termination resistor

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000448
ETIM 5.0/6.0 Class-Description: Terminal resistor

Protection rating
IP65/IP67

Ambient temperature (operation)
-25 °C to +90 °C

Contact material
CuSn

Coding
A - Standard (CANopen/DeviceNet)

Rated current (A)
4 A

Article number	Article designation	Number of pins	Rated voltage (V)	PU
Plug, unshielded (terminating resistor)				
22260766	AB-C5-M12MS-DN-TR	5	60	5

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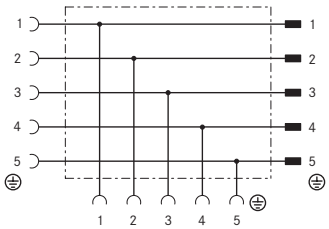
Accessories

- EPIC® DATA CAN M12T refer to page 88

DeviceNet CANopen

EPIC® DATA CAN M12T

M12 T parallel distributor for CAN/ DeviceNet/ S/A cabling



Benefits

- Cost-effective, efficient wiring of fieldbus and sensor/ actuator installations
- Space-saving due to compact dimensions
- Robust design

Product features

- For CANopen/DeviceNet applications
- PWIS-free

Product Make-up

- 5-pin parallel distributor
- M12 socket on M12 plug and M12 socket

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002585
ETIM 5.0/6.0 Class-Description:
Passive sensor-actuator interface

Material
Contact: CuZn
Contact surface: Ni/Au
Contact carrier: TPU GF
Knurl: Zinc die-cast, nickel-plated
Gripping body: TPU, flame-retardant, self-extinguishing
Sealing: NBR

Protection rating
IP65/IP67

Ambient temperature (operation)
Plug/ socket: -25 °C to +90 °C

Coding
A - Standard
(CANopen/DeviceNet/CC-Link)

Rated current (A)
4 A

Article number	Article designation	Number of pins	Rated voltage (V)	PU
T distributor				
22260765	AB-C5-M12T-2XM12FS DN	5	60	5

DeviceNet is a registered trademark of ODVA
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DeviceNet CANopen

EPIC® DATA CAN CCR

Cable coupler round, shielded for e.g. sensor-actuator / PROFIBUS / CAN cables

Benefits

- Time-saving assembly with IDC connection technology
- Optimum EMC protection with 360 ° shielding

Application range

- To extend existing cable systems
- Repairkit for damaged cables

Product features

- 5-pin cable coupler round
- Screened version

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002925
ETIM 5.0/6.0 Class-Description:
Sensor-actuator adapting connector

Material
Contact: CuZn
Contact surface: Ni/Au
Knurl: Zinc die-cast, nickel-plated
Gripping body: Zinc die-cast, nickel-plated

Protection rating
IP65/IP67

Ambient temperature (operation)
-40 °C to +85 °C

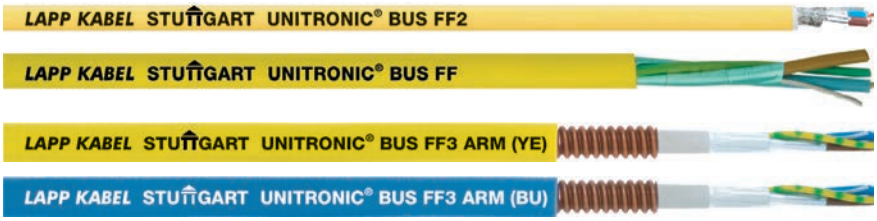
Rated current (A)
4 A

Article number	Article designation	Number of pins	Cross-section in mm²	Cable diameter in mm	Rated voltage (V)	PU
Cable coupler round						
21700641	AB-C5-CCR-SH	5	0.14 - 0.50	5.0 - 9.7	60	1

DeviceNet is a registered trademark of ODVA
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

UNITRONIC® BUS FF

FOUNDATION Fieldbus cable for use in Process Automation - UL-verified



Benefits

- Cables meet the requirements of ISA/SP50 and the FOUNDATION™ field bus for the cable type A.

Application range

- FOUNDATION™ Fieldbus is used in intrinsically safe areas, especially in the field of Process Automation
- Fixed Installation

Product features

- UV-resistant
- Extended temperature range

Norm references / Approvals

- With UL/CSA certification (CMG/PLTC)

Product Make-up

- 2-core, not armoured, with device ground
- 3-core, unarmoured, with device ground
- 3-core, armoured (longitudinally welded, spiral corrugated copper sheath) with device ground
- Outer sheath: PVC, yellow
  Armoured Version: PVC, yellow and blue

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
300 V

Conductor resistance
≤ 24 Ohm/km

Minimum bending radius
15 x outer diameter

Test voltage
1500 V

Characteristic impedance
100 ± 20 Ohm at 31.25 kHz

Temperature range
-40 °C or -25 °C to +105 °C, see data sheet

Article number	Article designation	Number of pairs and cable diameter	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PVC					
2170352	UNITRONIC® BUS FF 2	1 x 2 x 1.1	7.9	39.7	82
2170350	UNITRONIC® BUS FF 3	1x2x1.1 + 1x1.1 Ø	7.9	48.3	93
PVC - Armoured					
2170351	UNITRONIC® BUS FF 3 ARM (YE)	1x2x1.1 + 1x1.1 Ø	12.3	125	182
2170353	UNITRONIC® BUS FF 3 ARM (BU)	1x2x1.1 + 1x1.1 Ø	12.3	125	182

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Foundation™ is a trademark of the Fieldbus Foundation
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

UNITRONIC® BUS CC

CC-Link bus cable for fixed installation - UL-verified

Benefits

- The CC-Link® system was developed by Mitsubishi Electric Automation, Japan.
- This CC-Link® bus cable has successfully passed the CC-Link® Conformance Test in Japan.

Application range

- CC-Link® (Control & Communication Link) = field bus network, for both control as well as information data to provide efficient, integrated factory and process automation.
- Fixed installation of the CC-Link® network

Product features

- Transmission rate in relation to the distance
- 156 kbit/s 1.200 m
  625 kbit/s 600 m
  2,5 Mbit/s 200 m
  5,0 Mbit/s 110-150 m
  10 Mbit/s 50-100 m
- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- SUN RES acc. to UL 1581

Norm references / Approvals

- CM UL/CSA certification 75°C or PLTC Sun Res

Product Make-up

- Bare stranded copper wires
- Core insulation: PE
- Overall screening of braided tinned-copper strands
- Outer sheath: PVC, red (RAL 3000)

Info

- Lapp Kabel is a regular member of the user organisation CC-Link Partner Association (CLPA), Japan.

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
300 V

Conductor resistance
11 ohm/1,000 ft. (305 m) at 20°C

Minimum bending radius
Fixed installation: 5 x outer diameter
Flexing: 8 x outer diameter

Test voltage
2000 V

Characteristic impedance
110 ohm at 1 MHz

Temperature range
-40°C to +70°C

Article number	Article designation	Number of cores and AWG size	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS CC					
2170360	UNITRONIC® BUS CC	3 x 1 x AWG20	7.7	38.8	76.6

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
CC-Link® is a registered trademark of CC-Link Partner Association, Japan (CLPA)
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

UNITRONIC® BUS CC FD P FRNC

CC-Link bus cable for high fleible applications - UL-verified

Benefits

- The CC-Link® system was developed by Mitsubishi Electric Automation, Japan.

Application range

- CC-Link® (Control & Communication Link) = field bus network, for both control as well as information data to provide efficient, integrated factory and process automation.
- For highly flexible applications (power chains, moving machine parts)

Product features

- Transmission rate in relation to the distance
- 156 kbit/s 1.200 m
  625 kbit/s 600 m
  2,5 Mbit/s 200 m
  5,0 Mbit/s 110-150 m
  10 Mbit/s 50-100 m
- Halogen-free
- Flame-retardant according IEC 60332-1-2

Norm references / Approvals

- AWM 20233 80 °C 300V

Product Make-up

- Bare stranded copper wires
- Core insulation: PE
- Inner sheath: FRNC
- Overall screening of braided tinned-copper strands
- Outer sheath: PUR, red (RAL 3000)

Info

- Lapp Kabel is a regular member of the user organisation CC-Link Partner Association (CLPA), Japan.

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Certifications
UL AWM Style 20233

Peak operating voltage
300 V

Conductor resistance
11 ohm/1,000 ft. (305 m) at 20°C

Minimum bending radius
Fixed installation: 4 x outer diameter
Moved: 10 x outer diameter

Test voltage
2000 V

Characteristic impedance
110 ohm at 1 MHz

Temperature range
-40°C to +80°C

Article number	Article designation	Number of cores and AWG size	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS CC FD P FRNC					
2170370	UNITRONIC® BUS CC FD P FRNC	3 x 1 x AWG20	8.5	39.9	84

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths / CC-Link® is a registered trademark of CC-Link Partner Association, Japan (CLPA)
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

UNITRONIC® BUS SAFETY

SafetyBUS cables for transmission of safety-oriented datas

Benefits

- For serial transmission of safety-oriented data

Application range

- UNITRONIC® BUS SAEFTY - fixed Installation
  UNITRONIC® BUS SAEFTY FD P - highly flexible applications
- For systems such as SafetyBUS p®, based on the well-known CAN bus system

Product features

- The stated bit rates result in the following cable lengths (maximum) for a bus segment:
- 500 kbit/s = max.100 m
- 250 kbit/s = max. 250 m
- 125 kbit/s = max. 500 m
- 50 kbit/s = max. 1,000 m

Norm references / Approvals

- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- Bare stranded copper wires
- Core insulation: foam skin
- Tin-plated copper wire braiding
- Outer sheath: halogen-free, flame-retardant compound
- Outer sheath: yellow

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Certifications
Version UNITRONIC® BUS SAFETY FC: AWM Style 2464 (80°C 300 V)

Mutual capacitance
(800 Hz): max. 45 nF/km

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 52 ohm/km

Minimum bending radius
Fixed installation:
5 x outer diameter

Test voltage
Core/core: 3000 V
Core/core: 1500 V (FD- version)

Characteristic impedance
120 ohm

Temperature range
UNITRONIC BUS SAFETY:
Fixed installation: -30°C to +80°C
UNITRONIC BUS SAFETY FD P:
Fixed installation -40°C to +80°C
Moved: -30 to +80°C

Article number	Article designation	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Fixed Installation					
2170295	UNITRONIC® BUS SAFETY	3 x 0.75	7.6	49	68
Highly flexible applications					
2170885	UNITRONIC® BUS SAFETY FD P	3 x 0.75	7.8	49	68

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
SafetyBUS p® is a registered trademark of Pilz GmbH & Co.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- FC STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS IBS

INTERBUS cables for fixed installation

Info

- IBS - INTERBUS

Benefits

- Certified by INTERBUS CLUB

Application range

- Fixed Installation

Product features

- IBS cable - for fixed installation
- Remote bus cable + installation remote bus cable
- The stated bit rates result in the following cable lengths (maximum) of one bus segment:
  500 kbit/s = max. 400 m
- Halogen-free
- Flame-retardant according IEC 60332-1-2

Norm references / Approvals

- According to DIN EN 61158

Product Make-up

- **UNITRONIC® BUS IBS**
  Bare copper wire
  Core insulation: PE
  Overall copper braid screen
  Outer sheath: PVC, violet (RAL 4001)
- **UNITRONIC® BUS IBS P COMBI**
  Bare copper wire
  Core insulation: PE
  Overall copper braid screen
  Outer sheath: PUR, violet (RAL 4001)
- **UNITRONIC® BUS IBS A**
  similar to UNITRONIC BUS IBS,
  but with UL/CSA certification

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
Flexible use: 10 x outer diameter

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 186 ohm/km

Minimum bending radius
Fixed installation: 8 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
100 Ohm

Temperature range
Fixed installation: -30°C to +80°C
Flexing: -5°C to +70°C

Article number	Cable type	Article designation	Number of pairs and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Fixed Installation						
2170206	Remote bus cable (RBC)	UNITRONIC® BUS IBS	3 x 2 x 0.22	7.2	37	72
2170208	Installation remote bus cable (INBC)	UNITRONIC® BUS IBS P COMBI	3 x 2 x 0,22 + 3 x 1,0	7.9	60	85
For fixed installation - UL/CSA CMX certification						
2170209	Remote bus cable (RBC)	UNITRONIC® BUS IBS A	3 x 2 x 0.22	7.2	37	72

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
INTERBUS is a registered trademark of Phoenix Contact GmbH & Co.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- SENSOR STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS IBS Yv COMBI

INTERBUS cables for fixed installation - outdoor/direct burial

Benefits

- Certified by INTERBUS CLUB

Application range

- Suitable for outdoor use and direct burial

Product features

- IBS cable - for outdoor use or direct burial, UV-resistant (remote bus cable + installation remote bus cable)
- The stated bit rates result in the following cable lengths (maximum) of one bus segment:
- 500 kbit/s = max. 400 m
- Flame-retardant according IEC 60332-1-2

Norm references / Approvals

- According to DIN EN 61158

Product Make-up

- **UNITRONIC® BUS IBS Yv**
  stranded bare conductor
  Core insulation: PE
  Tinned copper screen braiding
  Outer sheath: PVC, black (RAL 9005)
- **UNITRONIC® BUS IBS Yv COMBI**
  Stranded bare conductor
  Core insulation: PE
  3x2x0,22:
  white/brown, green/yellow, grey/pink
  3x1,0:
  red, blue, green/yellow
  Tinned copper screen braiding
  Inner sheath: PVC, violet RAL (4001),
  Outer diameter: 7,9 mm
  Outer sheath: PVC, black (RAL 9005)
  Outer diameter: 9,4 mm

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 186 ohm/km

Minimum bending radius
Fixed installation: 8 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
100 Ohm

Temperature range
Fixed installation: -40°C to +70°C

Article number	Cable type	Article designation	Number of pairs and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® BUS IBS Yv COMBI						
2170207	Remote bus cable (RBC)	UNITRONIC® BUS IBS Yv COMBI	3 x 2 x 0.22	9.3	37	94
UNITRONIC® BUS IBS Yv COMBI						
2170217	Installation remote bus cable (INBC)	UNITRONIC® BUS IBS Yv COMBI	3 x 2 x 0,22 + 3 x 1,0	9.4	60	128

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
INTERBUS is a registered trademark of Phoenix Contact GmbH & Co.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

UNITRONIC® BUS IBS FD P

INTERBUS cables for use in high flexible applications

Info

- IBS - INTERBUS

Benefits

- Certified by INTERBUS CLUB

Application range

- For highly flexible use in energy supply chains or permanently moving machines and linear robots
- Dry or damp rooms
- Harsh industrial environment

Product features

- Halogen-free
- Remote bus cable + installation remote bus cable
- 500 kbit/s = max. 400 m (remote bus cable)
- Max. 50 m (installation remote bus cable)
- PUR outer sheath, tear and notch-resistant, resistant to mineral oils and abrasion when used in power chains

Norm references / Approvals

- According to DIN EN 61158
- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- **UNITRONIC® BUS IBS FD P**
  Bare copper wire, extra fine
  core identification: acc. to DIN 47100
  Overall copper braid screen
  Outer sheath: PUR, violet (RAL 4001)
- **UNITRONIC® BUS IBS FD P COMBI**
  Stranded bare conductor
  Core insulation: PE
  3x2x0,25:
  white/brown, green/yellow, grey/pink
  3x1,0:
  red, blue, green/yellow
  Tinned copper screen braiding
  Outer sheath: PUR, violet (RAL 4001)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz) max. 60 nF/km

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 159.8 ohm/km

Minimum bending radius
Flexing: 15 x outer diameter

Test voltage
Core/core: 1500 V rms

Characteristic impedance
100 Ohm

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C

Article number	Cable type	Article designation	Number of pairs and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Highly flexible applications						
2170216	Remote bus cable (RBC)	UNITRONIC® BUS IBS FD P	3 x 2 x 0.25	7.9	39	64
2170218	Installation remote bus cable (INBC)	UNITRONIC® BUS IBS FD P COMBI	3 x 2 x 0,25 + 3 x 1,0	7.9	62	92
Highly flexible applications - with UL/CSA (CMX) certification						
2170818	Installation remote bus cable (INBC)	UNITRONIC® BUS IBS FD P COMBI A	3 x 2 x 0,25 + 3 x 1,0	7.9	62	92

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
INTERBUS is a registered trademark of Phoenix Contact GmbH & Co.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Multipurpose shears A and B refer to main catalogue 2018/19
- SMART STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® BUS EIB / KNX

Info

- EIB / European Installation Bus
- KNX/communication in building management

Application range

- The product is designed for use in building management, e.g. for decentralised control of lighting, heating, air-conditioning, ventilation, energy management, blinds, time management, locking systems etc.
- The cable can be laid on or under plaster; in pipes, cable ducts; in dry, damp or wet environments.
- EIB installation mainly consists of sensors/command-transmitters (e.g. light barriers, switches, thermostats, infrared, wind meters, timers), and actuators (e.g. engines, heaters, ventilators, lights, blinds).
- KNX technology was formed from the merging of three established European bus standards: EIP, EHS (household appliances and consumer electronics) and Batibus (heating/ventilation/air conditioning)

Product features

- Serial data transmission
- EIB cable has been tested at 4 kV (1 min.) in a water bath

Product Make-up

- Screened installation cable based on type J-Y(ST)Y according to DIN VDE 0815
- **UNITRONIC® BUS EIB**
  Bare solid copper wire
  2x2x0,8: red and black, white and yellow
  Core insulation: PVC
  Overall aluminum foil
  Outer sheath: PVC, green (RAL 6017)
- **UNITRONIC® BUS EIBCOMBI**
  Bare solid copper wire
  Core insulation: PVC
  2x2x0,8: red and black, white and yellow
  3x1,5: brown, blue, green/yellow
  Overall aluminum foil
  Outer sheath: PVC, green (RAL 6017)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Mutual capacitance
(800 Hz) max. 100 nF/km

Peak operating voltage
(not for power applications) 250 V

Conductor resistance
(loop): max. 73.2 ohm/km

Minimum bending radius
Fixed installation:
5 x outer diameter

Test voltage
Core/core: 4000 V

Temperature range
Fixed installation: -30°C to +70°C

Article number	Article designation	Number of pairs and mm or mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/m)
PVC					
2170240	UNITRONIC® BUS EIB	2 x 2 x 0.8	6.6	21	54
2170242	UNITRONIC® BUS EIB COMBI	2 x 2 x 0,8 mm + 3 x 1,5 mm²	12.7	64	128
Halogen-free					
2170241	UNITRONIC® BUS EIB H	2 x 2 x 0.8	6.6	21	54

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 100/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- SENSOR STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® SENSOR master cable

Info

- Customised construction can be supported

Benefits

- Cost efficient and rational wiring for S/A boxes with detachable master cable connection
- Can be used universally for S/A installations

Application range

- Automation technology
- Mechanical engineering
- Plant engineering
- Tool shop
- Automotive industry

Product features

- Cores for Power Supply: 3 x 0.75 mm2 and 3 x 1.0 mm2
- Cores for Signalling cable: 4 x 0.34 mm2, 8 x 0.5 mm2, 16 x 0.5 mm2
- Suitable for drag chains
- Halogen-free according to VDE 0472-815
- Flame-retardant according to UL 1581 FT-2

Norm references / Approvals

- UL-AWM-Style 21198 (80 °C / 300 V)

Product Make-up

- Fine-wire, bare copper strand
- Single wire diameter: 0.34 mm2 = (43 x 0.10 mm) 0.5mm2 = (19 x 0.18 mm) 0.75 mm2 = (21 x 0.205 mm) 1.0 mm² = (55 x 0.15 mm)
- Core insulation: PP
- Outer sheath: PUR, black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001578
ETIM 5.0/6.0 Class-Description: Flexible cable

Conductor stranding
Stranded conductor, fine-wire

Minimum bending radius
Flexing: 10 x outer diameter

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -5°C to +80°C

Article number	Article designation	Dimensions (mm²)	Outer diameter [mm]	Core/outer sheath material	Copper index [kg/km]
UNITRONIC® SENSOR COMBI					
7038880	Li9Y11Y	3 x 0.75 + 4 x 0.34	6.6	PP/PUR	34.5
7038881	Li9Y11Y	3 x 1.0 + 8 x 0.5	8.4	PP/PUR	67.2
7038882	Li9Y11Y	3 x 1.0 + 16 x 0.5	9.8	PP/PUR	105.6

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Packaging size: Coil 100m
Cables are printed
Other variations are available upon request.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
For detailed technical information please refer to the data sheet

Accessories

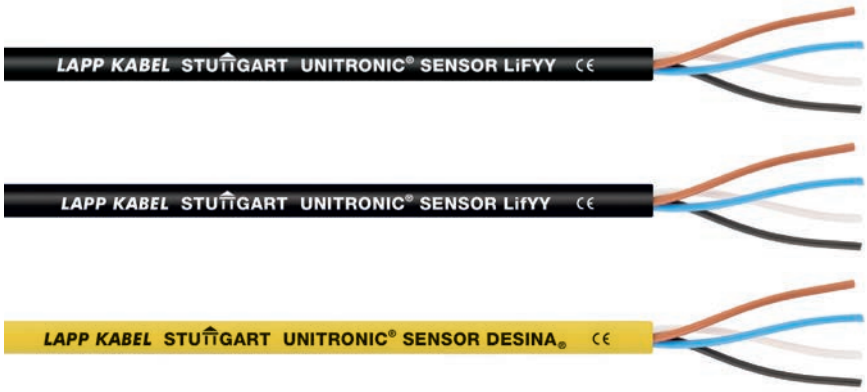
- Distribution Box M12 refer to page 110

UNITRONIC® SENSOR

Flexible cable for sensor/actuator cabling

Info

- Easy cable preperation
- UL recognized (LifYY A)



Benefits

- Easy installation (through cable trays, tubes, cabinets)
- Easy stripping and processing
- Space-saving due to compact dimensions

Application range

- Automation technology
- Sensor/ actuator cabling

Product features

- Core colour code in accordance with DIN EN 50044
- Black version: UV-resistant
- For higher mechanical stress (LifY 11Y/ Desina®)

Norm references / Approvals

- UL recognized (LifYY A)

Product Make-up

- Extra-fine wire strand made of bare copper wires
- Core insulation: PVC
- Colour-code:
  3-pin: bn, bu, bk
  4-pin: bn, wh, bu, bk
  5-pin: bn, wh, bu, bk, gy
- DESINA® 4x0,34: bn, wh, bu, bk
- Outer sheath: PVC or PUR
- Sheath colour: black (RAL 9005)
- DESINA® yellow (RAL 1021)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001578
ETIM 5.0/6.0 Class-Description: Flexible cable

Peak operating voltage
300 V (not for power applications)

Conductor stranding
Extra-fine wire acc. to VDE 0295, class 6/ IEC 60228 class 6

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 8 x outer diameter

Temperature range
PVC/PVC:
Fixed installation: -40°C to +80°C
Flexing: -5°C to +80°C
PVC/PUR:
Fixed installation: -30°C to +80°C
Flexing: -10°C to +80°C

Article number	Article designation	Dimensions (mm²)	Outer diameter [mm]	Core/outer sheath material	Colour	UL	Copper index [kg/km]
UNITRONIC® SENSOR PVC							
7038898	LifYY	3x0.25	3.8	PVC/PVC	black		7.5
7038899	LifYY	4x0.25	4.2	PVC/PVC	black		10.2
7038900	LifYY	3 x 0.34	4.1	PVC/PVC	black		9.8
7038901	LifYY	4 x 0.34	4.4	PVC/PVC	black		13
7038902	LifYY	5 x 0.34	4.8	PVC/PVC	black		16
UNITRONIC® SENSOR PVC UL							
7038903	LifYY A	3x0.25	4.3	PVC/PVC	black	yes	7.5
7038904	LifYY A	4x0.25	4.6	PVC/PVC	black	yes	10.2
7038905	LifYY A	3 x 0.34	4.4	PVC/PVC	black	yes	9.8
7038906	LifYY A	4 x 0.34	4.8	PVC/PVC	black	yes	13
7038907	LifYY A	5 x 0.34	5.2	PVC/PVC	black	yes	16
UNITRONIC® SENSOR PVC/PUR							
7038861	LifY 11Y	4 x 0.34	4.8	PVC/PUR	black		13.1
7038862	LifY 11Y	5 x 0.25	4.9	PVC/PUR	black		12
0040434	DESINA	4 x 0.34	5.2	PVC/PUR	yellow		13.5

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M12 refer to page 103
- EPIC® SENSOR M12 V4A refer to page 104
- EPIC® SENSOR M8 refer to page 100
- SENSOR STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® SENSOR FD

High flexible cable for sensor/actuator cabling for use in drag chains, halogen-free

Info

- For increased mechanical stress and harsh operating conditions

Benefits

- Designs for highly flexible use
- Abrasion-resistant
- Wear-resistant
- Space-saving due to compact dimensions

Application range

- Automation technology
- Sensor/ actuator cabling
- Mechanical and plant engineering
- Assembly and production lines

Product features

- UV-resistant
- Halogen-free according to VDE 0472-815
- Flame-retardant according to IEC 60332-2-2, UL 1581 FT-2
- Suitable for drag chains
- Designed for 4 million alternating bending cycles and travel distances up to 10 m

Norm references / Approvals

- UL AWM Style 20549

Product Make-up

- Extra-fine wire strand made of bare copper wires
- Core insulation: PP
- Colour-code:
  3-pin: bn, bu, bk
  4-pin: bn, wh, bu, bk
  5-pin: bn, wh, bu, bk, gy
  8-pin: bn, wh, gn, ye, gy, pk, bu, rd
- Outer sheath: PUR, black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001578
ETIM 5.0/6.0 Class-Description: Flexible cable

Peak operating voltage
300 V (not for power applications)

Conductor stranding
Extra-fine wire acc. to VDE 0295, class 6/ IEC 60228 class 6

Minimum bending radius
Fixed installation: 5 x outer diameter
Flexing: 10 x outer diameter

Temperature range
Occasional flexing: -25°C to +80°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Dimensions (mm²)	Outer diameter [mm]	Core/outer sheath material	Colour	Copper index [kg/km]
UNITRONIC® SENSOR FD						
7038883	LiF9Y11Y	3x0.25	4.4	PP/PUR	black	7.5
7038867	LiF9Y11Y	5 x 0.25	4.7	PP/PUR	black	12
7038868	LiF9Y11Y	8 x 0.25	5.9	PP/PUR	black	19
7038864	LiF9Y11Y	3 x 0.34	4.6	PP/PUR	black	9.8
7038865	LiF9Y11Y	4 x 0.34	4.7	PP/PUR	black	13
7038866	LiF9Y11Y	5 x 0.34	5.1	PP/PUR	black	16
UNITRONIC® SENSOR FD - optimized						
7038889	LiF9Y11Y	3x0.25	3.6	PP/PUR	black	7.5
7038890	LiF9Y11Y	4x0.25	3.8	PP/PUR	black	10.2
7038893	LiF9Y11Y	5 x 0.34	4.5	PP/PUR	black	16
UNITRONIC® SENSOR FD screened						
7038885	LiF9YC11Y	3 x 0.34	4.3	PP/PUR	black	19.1
7038886	LiF9YC11Y	4 x 0.34	4.6	PP/PUR	black	23.5
7038887	LiF9YC11Y	5 x 0.34	5	PP/PUR	black	27.5

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Other types of composition are available upon request.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M12 refer to page 103
- EPIC® SENSOR M12 V4A refer to page 104
- EPIC® SENSOR M8 refer to page 100
- STAR STRIP stripping tool refer to main catalogue 2018/19
- SMART STRIP stripping tool refer to main catalogue 2018/19

UNITRONIC® ROBUST S/A FD

High flexible, halogen-free sensor/actuator cable - resistant to a wide range of chemical media

Info

- Good chemical resistance
- Excellent weather resistance
- Flexible at low temperatures

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant against organic oils, emulsions, greases and waxes based on organic, animal or synthetic
- Good resistance to cold and hot water as well as water-soluble cleaning and cooling agents
- Well-suited to steam cleaning
- Good resistance to ammonia compounds and bio-gases

Application range

- Automation technology
- Machine tool building, medical technology, laundries, car washing equipment, chemical industry, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products

Product features

- Good chemical resistance to ester-based hydraulic fluids
- Ozone, UV and weather-resistant according to EN 50396 and HD 605 S2
- Suitable for drag chains
- Torsion-resistant
- Halogen-free

Norm references / Approvals

- Certified resistance to disinfection and cleaning solutions used in food and beverage industry
- ECOLAB®
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry

Product Make-up

- Extra-fine wire strand made of bare copper
- Core insulation: PE
- Colour-code:
  3-pin: bn, bu, bk
  4-pin: bn, wh, bu, bk
  5-pin: bn, wh, bu, bk, gy
- Outer sheath made of special TPE
- Color of the outer jacket: Black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001578
ETIM 5.0/6.0 Class-Description: Flexible cable

Core identification code
acc. to EN 60947-5-2

Conductor stranding
Extra-fine wire according to VDE 0295, class 6/IEC 60228 class 6

Minimum bending radius
Flexing: 5 x outer diameter
Fixed installation: 3 x outer diameter

Temperature range
Flexing: -40°C to +90°C
Fixed installation: -50°C to +90°C

Article number	Dimensions (mm²)	Outer diameter [mm]	Colour	Copper index [kg/km]
UNITRONIC® ROBUST S/A FD				
7038897	4x0.25	4.9	black	10.2
7038895	3 x 0.34	5	black	9.8
7038894	4 x 0.34	5.4	black	13.1
7038896	5 x 0.34	5.9	black	16

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Other types of composition are available upon request.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M12 refer to page 103
- EPIC® SENSOR M12 V4A refer to page 104
- EPIC® SENSOR M8 refer to page 100
- STAR STRIP stripping tool refer to main catalogue 2018/19

EPIC® SENSOR M8

Field mountable connectors M8

Benefits

- Easy connection with proven srew clamp connection
- For creating of individual cable lengths
- Quick and easy on-site assembly
- No special tools required for connecting the cables
- Time-saving assembly with IDC connection technology

Product features

- 3 and 4-pin version
- Version with piercing, insulation displacement contacts (IDC) or screw connection
- PWIS-free

Suitable cables

- UNITRONIC® SENSOR Page 97
- UNITRONIC® SENSOR FD Page 98
- UNITRONIC® ROBUST S/A FD Page 99

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Material
Contact: CuZn
Contact surface: Au (gold)

Protection rating
IP 65/IP 67 (IDC)
IP 68 (piercing)
IP 67 (screw)

Ambient temperature (operation)
Plug/socket
-25°C to +80°C (IDC)
-25°C to +85°C (piercing)
-40°C to +85°C (screw)

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Number of pins	Connection type	Cross-section in mm²	Cable diameter in mm	Rated voltage (V)	PU
Plug, straight							
22260993	AB-C3-M8MS-F0,25	3	IDC	0.08 - 0.25	2.5 - 5	60	1
22260985	AB-C3-M8MS-F0,5	3	IDC	0.25 - 0.5	2.5 - 5	60	1
22260043	AB-C4-M8MS-F0,25	4	IDC	0.08 - 0.25	2.5 - 5	30	1
22260044	AB-C4-M8MS-F0,5	4	IDC	0.25 - 0.5	2.5 - 5	30	1
22260122	AB-C3-M8MS-P	3	Piercing	0.14 - 0.38	3 - 5	60	1
22260123	AB-C4-M8MS-P	4	Piercing	0.14 - 0.38	3 - 5	30	1
22260120	AB-C3-M8MS	3	screw	0.14 - 0.5	3.5 - 5	60	1
22260121	AB-C4-M8MS	4	screw	0.14 - 0.5	3.5 - 5	30	1
Plug, straight shielded							
22262025	AB-C3-M8MS-M-0,34-SH	3	screw	0.14 - 0.5	3.5 - 5.5	60	1
22262027	AB-C4-M8MS-M-0,34-SH	4	screw	0.14 - 0.5	3.5 - 5	30	1
Plug, angled							
22262110	AB-C3-M8MA	3	screw	0.14 - 0.5	3.5 - 5	60	1
22262111	AB-C4-M8MA	4	screw	0.14 - 0.5	3.5 - 5	30	1
Socket, straight							
22260994	AB-C3-M8FS-F0,25	3	IDC	0.08 - 0.25	2.5 - 5	60	1
22260986	AB-C3-M8FS-F0,5	3	IDC	0.25 - 0.5	2.5 - 5	60	1
22260045	AB-C4-M8FS-F0,25	4	IDC	0.08 - 0.25	2.5 - 5	30	1
22260046	AB-C4-M8FS-F0,5	4	IDC	0.25 - 0.5	2.5 - 5	30	1
22260124	AB-C3-M8FS-P	3	Piercing	0.14 - 0.38	3 - 5	60	1
22260119	AB-C4-M8FS-P	4	Piercing	0.14 - 0.38	3 - 5	30	1
22260125	AB-C3-M8FS	3	screw	0.14 - 0.5	3.5 - 5	60	1
22260126	AB-C4-M8FS	4	screw	0.14 - 0.5	3.5 - 5	30	1
Socket, straight shielded							
22262026	AB-C3-M8FS-M-0,34-SH	3	screw	0.14 - 0.5	3.5 - 5.5	60	1
22262028	AB-C4-M8FS-M-0,34-SH	4	screw	0.14 - 0.5	3.5 - 5.5	30	1
Socket, angled							
22262112	AB-C3-M8FA	3	screw	0.14 - 0.5	3.5 - 5	60	1
22262113	AB-C4-M8FA	4	screw	0.14 - 0.5	3.5 - 5	30	1

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EPIC® SENSOR Flush-type M8

Benefits

- Flexible connection solutions for individual device concepts
- Simple installation in devices (e.g. cabinet)

Application range

- Connection of enclosures and cabinets

Product features

- M8 fastening thread
- Designs for front mounting
- PWIS-free

Product Make-up

- TPE single strands, l = 0.5 m
- Core cross section: 0.25 mm2

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002061
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector chassis

Material
Contact: CuSn
Contact surface: Ag

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket
-25°C to +85°C

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Number of pins	Rated voltage (V)	PU
Panel-mount connector male				
22260100	AB-C3-M8MS-0,5	3	60	1
22260101	AB-C4-M8MS-0,5	4	30	1
Panel-mount connector female				
22260102	AB-C3-M8FS-0,5	3	60	1
22260103	AB-C4-M8FS-0,5	4	30	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Matching fitting nut: 22260104

UNITRONIC® SENSOR HD M12

S/A cable: Hygienic Design for Food&Beverage

Info

- IP69 for high-pressure cleaning
- - 40 °C to + 105 °C

Benefits

- Hygienic Design for ideal cleaning results
- Guaranteed density by meeting the highest protection class
- Stainless steel knurl to ensure protection against corrosion
- Bright colors to detect contamination quickly

Application range

- Food production and packaging machinery
- Freezing plants, cold storage
- Washdown area with frequent contact with cleaning agents

Product features

- Suitable for drag chains
- 4-pin plug/socket M12 on free conductor end

Norm references / Approvals

- ECOLAB®
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry
- FDA 21 CFR 177.2600
  Special sealing element for food and beverage industry in North America

Product Make-up

- Wire cross-section: 0,34 mm²
- Colour-code:
  4-pin: bn (1), wh (2), bu (3), bk (4)
- Outer sheath: TPE halogen-free, grey (similar to RAL 7035)

Suitable tools

- DATA STRIP stripping tool refer to main catalogue 2018/19
- Fibre Strip DC

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001855
ETIM 5.0/6.0 Class-Description: Sensor-actuator patch cord

Material
Contact: CuSn
Contact surface: Ni/Au
Knurl: Stainless steel (V4A)
Gripping body: PP

Minimum bending radius
Fixed installation: 5 x outer diameter
Flexing: 10 x outer diameter

Protection rating
IP65/IP67/IP68/IP69

Ambient temperature (operation)
Fixed installation -40°C to +105°C
Flexing -25°C to +105°C

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Number of pins	Length (m)	Design	LED	Rated voltage (V)	PU
4-pin							
Plug							
22262040	AB-C4-M12MS-2,0TPE-HD	4	2	straight	no	250	1
22262041	AB-C4-M12MS-5,0TPE-HD	4	5	straight	no	250	1
22262060	AB-C4-M12MS-7,5TPE-HD	4	7.5	straight	no	250	1
22262042	AB-C4-M12MS-10,0TPE-HD	4	10	straight	no	250	1
22262061	AB-C4-M12MS-15,0TPE-HD	4	15	straight	no	250	1
Socket							
22262043	AB-C4-2,0TPE-M12FS-HD	4	2	straight	no	250	1
22262044	AB-C4-5,0TPE-M12FS-HD	4	5	straight	no	250	1
22262062	AB-C4-7,5TPE-M12FS-HD	4	7.5	straight	no	250	1
22262045	AB-C4-10,0TPE-M12FS-HD	4	10	straight	no	250	1
22262063	AB-C4-15,0TPE-M12FS-HD	4	15	straight	no	250	1
22262046	AB-C4-2,0TPE-M12FA-HD	4	2	angled	no	250	1
22262047	AB-C4-5,0TPE-M12FA-HD	4	5	angled	no	250	1
22262064	AB-C4-7,5TPE-M12FA-HD	4	7.5	angled	no	250	1
22262048	AB-C4-10,0TPE-M12FA-HD	4	10	angled	no	250	1
22262065	AB-C4-15,0TPE-M12FA-HD	4	15	angled	no	250	1

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No copper surcharge.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M12 refer to page 103
- EPIC® SENSOR M12 V4A refer to page 104
- EPIC® SENSOR M12/M12 refer to page 105

EPIC® SENSOR M12

Field mountable connectors M12

Benefits

- For creating of individual cable lengths
- No special tools required for connecting the cables
- Time-saving assembly with IDC connection technology
- Easy connection with proven srew clamp connection

Product features

- 4, 5 and 8-pin version
- Screened and non-screened version
- Screw connection or insulation displacement contacts (IDC)
- PWIS-free

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Material
Contact: CuZn
Contact surface: CuSnZn

Protection rating
IP 65/IP 67 (IDC)
IP 67 (screw)

Ambient temperature (operation)
Plug/socket
-25°C to +80°C (IDC)
-40°C to +85°C (screw)

Coding
A-standard

Rated current (A)
4 A
2 A (8-pin)

Article number	Article designation	Number of pins	Connection type	Cross-section in mm²	Cable diameter in mm	Rated voltage (V)	PU
Plug, straight							
22260132	AB-C4-M12MS-F0,34	4	IDC	0.14 - 0.34	3.5 - 6	125	1
22260134	AB-C4-M12MS-F0,75	4	IDC	0.34 - 0.75	4 - 8	250	1
22260649	AB-C4-M12MS-PG7	4	screw	0.25 - 0.75	4 - 6	250	1
22260995	AB-C4-M12MS-PG9	4	screw	0.25 - 0.75	6 - 8	250	1
22260129	AB-C5-M12MS-PG7	5	screw	0.25 - 0.75	4 - 6	60	1
22260651	AB-C5-M12MS-PG9	5	screw	0.25 - 0.75	6 - 8	60	1
22260996	AB-C5-M12MS-PG9-SKINTOP®	5	screw	0.25 - 0.75	6 - 8	60	1
Plug, straight shielded							
22260135	AB-C5-M12MS-PG9-SH	5	screw	0.25 - 0.75	6 - 8	60	1
22260825	AB-C8-M12MS-PG9-SH	8	screw	0.25 - 0.75	6 - 8	30	1
Plug, angled							
22260647	AB-C4-M12MA-PG7	4	screw	0.25 - 0.75	4 - 6	250	1
22260130	AB-C5-M12MA-PG7	5	screw	0.25 - 0.75	4 - 6	60	1
22260648	AB-C5-M12MA-PG9	5	screw	0.25 - 0.75	6 - 8	60	1
22262023	AB-C5-M12MA-PG9-SKINTOP®	5	screw	0.25 - 0.75	6 - 8	60	1
Plug angled, shielded							
22262108	AB-C5-M12MA-PG7-SH	5	screw	0.25 - 0.75	4 - 6	60	1
Socket, straight							
22260131	AB-C4-M12FS-F0,34	4	IDC	0.14 - 0.34	3.5 - 6	125	1
22260133	AB-C4-M12FS-F0,75	4	IDC	0.34 - 0.75	4 - 8	250	1
22260640	AB-C4-M12FS-PG7	4	screw	0.25 - 0.75	4 - 6	250	1
22260641	AB-C4-M12FS-PG9	4	screw	0.25 - 0.75	6 - 8	250	1
22260127	AB-C5-M12FS-PG7	5	screw	0.25 - 0.75	4 - 6	60	1
22260644	AB-C5-M12FS-PG9	5	screw	0.25 - 0.75	6 - 8	60	1
22260997	AB-C5-M12FS-PG9-SKINTOP®	5	screw	0.25 - 0.75	6 - 8	60	1
Socket, straight shielded							
22260136	AB-C5-M12FS-PG9-SH	5	screw	0.25 - 0.75	6 - 8	60	1
22260826	AB-C8-M12FS-PG9-SH	8	screw	0.25 - 0.75	6 - 8	30	1
Socket, angled							
22260636	AB-C4-M12FA-PG7	4	screw	0.25 - 0.75	4 - 6	250	1
22260128	AB-C5-M12FA-PG7	5	screw	0.25 - 0.75	4 - 6	60	1
22260638	AB-C5-M12FA-PG9	5	screw	0.25 - 0.75	6 - 8	60	1
22262024	AB-C5-M12FA-PG9-SKINTOP®	5	screw	0.25 - 0.75	6 - 8	60	1
Socket angled, shielded							
22262109	AB-C5-M12FA-PG7-SH	5	screw	0.25 - 0.75	4 - 6	60	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® SENSOR M12 V4A

Field mountable connectors M12 for Food & Beverage/ Outdoor

Benefits

- Stainless steel knurl to ensure protection against corrosion
- Quick and easy on-site assembly
- For creating of individual cable lengths
- Space-saving due to compact dimensions
- Easy connection with proven srew clamp connection

Application range

- Automation systems
- Conveyor and transport systems
- Food production and packaging machinery
- Version SKINTOP® for Outdoor applications

Product features

- 4-pin connector
- Screw connection
- PWIS-free

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Material
Contact: CuZn
Contact surface: Au (gold)
Knurl: Stainless steel (V4A)

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket -40°C to +85°C

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Number of pins	Cross-section in mm²	Cable diameter in mm	Rated voltage (V)	PU
Plug, straight						
22262049	AB-C4-M12MS-PG7-VA	4	0.25 - 0.75	4 - 6	250	1
22262123	AB-C4-M12MS-PG7-VA-SKINTOP	4	0.25 - 0.75	4.0 - 6.5	250	1
Socket, straight						
22262050	AB-C4-M12FS-PG7-VA	4	0.25 - 0.75	4 - 6	250	1
22262124	AB-C4-M12FS-PG7-VA-SKINTOP	4	0.25 - 0.75	4.0 - 6.5	250	1
Socket angled						
22262051	AB-C4-M12FA-PG7-VA	4	0.25 - 0.75	4 - 6	250	1

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DeviceNet CANopen

EPIC® SENSOR M12/M12

M12 control cabinet feed-through, shielded for CAN/DeviceNet/ S/A cabling

Benefits

- Plug & Play for flexible connection solutions
- M12 connector on both sides

Product features

- For CANopen/DeviceNet applications
- For sensor/actuator cabling
- Bipolar/screw mounting

Product Make-up

- 5-pin control cabinet feed-through, M12 A-coded
- M12 plug on M12 socket
- Screened version

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002061
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector chassis

Material
Contact: CuZn
Contact surface: Au (gold)
Contact carrier: PA 66
Knurl: Nickel-plated brass
Sealing: FKM

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket
-25°C to +85°C

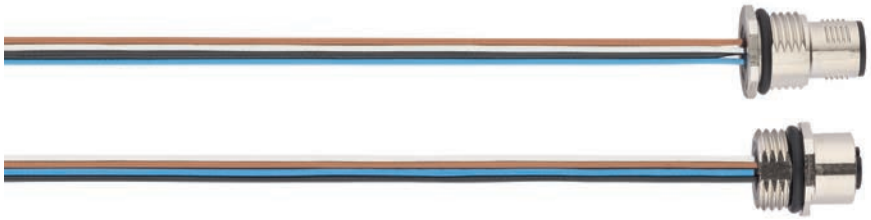
Coding
A - Standard
(CANopen/DeviceNet/CC-Link)

Rated current (A)
4 A

Article number	Article designation	Number of pins	Rated voltage (V)	PU
Control cabinet feed through				
22262020	AB-C5-DSI-M12MS-M12FS-M16-SH	5	24	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® SENSOR Flush-type M12



Benefits

- Flexible connection solutions for individual device concepts
- Simple installation in devices (e.g. cabinet)
- Outside plugable with M12 connection, inside housing connected with fixed wires

Application range

- Connection of enclosures and cabinets

Product features

- With M12, M16 or PG9 fastening thread
- Designs for front and rear wall-mounting
- M12 connector, A-coded with quick-locking system
- PWIS-free
- Rear wall-mounting versions inclusive fitting nut

Norm references / Approvals

- UL File Number: E249137

Product Make-up

- TPE single strands, l = 0.5 m
- Wire cross-section: 0,34 mm²

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002061
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector chassis

Material
Contact: CuZn
Contact surface: Au (gold)

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket
-25°C to +85°C

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Number of pins	Fastening thread	Rated voltage (V)	PU
Plug for front-mounting					
22260108	AB-C4-M12MS-M16-0,5	4	M16	250	1
22260106	AB-C5-M12MS-M16-0,5	5	M16	60	1
22260083	AB-C4-M12MS-M16-PO-0,5	4	M16 positionable	250	1
22260084	AB-C5-M12MS-M16-PO-0,5	5	M16 positionable	60	1
22260113	AB-C4-M12MS-PG9-0,5	4	PG9	250	1
22260112	AB-C5-M12MS-PG9-0,5	5	PG9	60	1
22260087	AB-C4-M12MS-PG9-PO-0,5	4	PG9 positionable	250	1
22260088	AB-C5-M12MS-PG9-PO-0,5	5	PG9 positionable	60	1
Plug for rear-mounting					
22260999	AB-C4-DSI-M12MS-M12-0,5	4	M12	250	1
22260117	AB-C4-DSI-M12MS-PG9-0,5	4	PG9	250	1
22260115	AB-C5-DSI-M12MS-PG9-0,5	5	PG9	60	1
Socket for front-mounting					
22260107	AB-C4-M12FS-M16-0,5	4	M16	250	1
22260105	AB-C5-M12FS-M16-0,5	5	M16	60	1
22260085	AB-C4-M12FS-M16-PO-0,5	4	M16 positionable	250	1
22260086	AB-C5-M12FS-M16-PO-0,5	5	M16 positionable	60	1
22260114	AB-C4-M12FS-PG9-0,5	4	PG9	250	1
22260111	AB-C5-M12FS-PG9-0,5	5	PG9	60	1
22260089	AB-C4-M12FS-PG9-PO-0,5	4	PG9 positionable	250	1
22260090	AB-C5-M12FS-PG9-PO-0,5	5	PG9 positionable	60	1
Socket for rear-mounting					
22260118	AB-C4-DSI-M12FS-PG9-0,5	4	PG9	250	1
22260116	AB-C5-DSI-M12FS-PG9-0,5	5	PG9	60	1

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: inclusive of copper. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Matching fitting nut: 22261062 (M12), 52003500 (PG9), 22260110 (M16)

DeviceNet CANopen

EPIC® SENSOR M12 T-distributor

M12 T parallel distributor for CAN/ DeviceNet/ S/A cabling

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002585
ETIM 5.0/6.0 Class-Description:
Passive sensor-actuator interface

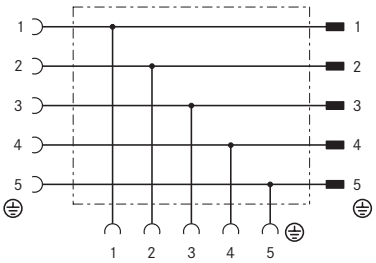
Material
Contact: CuZn
Contact surface: Ni/Au
Contact carrier: TPU GF
Knurl: Zinc die-cast, nickel-plated
Gripping body: TPU, flame-retardant, self-extinguishing
Sealing: NBR

Protection rating
IP65/IP67

Ambient temperature (operation)
Plug/ socket: -25°C to +90°C

Coding
A - Standard
(CANopen/DeviceNet/CC-Link)

Rated current (A)
4 A



Benefits

- Cost-effective, efficient wiring of fieldbus and sensor/ actuator installations
- Space-saving due to compact dimensions
- Robust design

Product features

- PWIS-free

Product Make-up

- 5-pin parallel distributor
- M12 socket on M12 plug and M12 socket

Article number	Article designation	PU
T distributor		
22260765	AB-C5-M12T-2XM12FS DN	5

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DeviceNet CANopen

EPIC® SENSOR CCR

Cable coupler round, shielded for e.g. sensor-actuator / PROFIBUS / CAN cables

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002925
ETIM 5.0/6.0 Class-Description:
Sensor-actuator adapting connector

Material
Contact: CuZn
Contact surface: Ni/Au
Knurl: Zinc die-cast, nickel-plated
Gripping body: Zinc die-cast, nickel-plated

Protection rating
IP65/IP67

Ambient temperature (operation)
-40°C to +85°C

Rated current (A)
4 A

Benefits

- Optimum EMC protection with 360 ° shielding
- Time-saving assembly with IDC connection technology

Application range

- To extend existing cable systems
- Repairkit for damaged cables

Product features

- 5-pin cable coupler round
- Screened version

Article number	Article designation	Number of pins	Cross-section in mm²	Cable diameter in mm	Rated voltage (V)
Cable coupler round					
21700641	AB-C5-CCR-SH	5	18.00 - 26.00	5.0 - 9.7	60

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EPIC® SENSOR M8Y | M12Y

Y distributor M8 | M12

Benefits

- Cost-saving due to quick and easy installation
- Space-saving due to compact dimensions
- Fast and easy error tracking

Product features

- Design: Plug on 2x socket
- M12 design with screw hole
- PWIS-free

Product Make-up

- 22260600:
  M12, 3-pin+ PE, straight M12 plug on 2x straight M12 socket, pin 2+4 bridged
- 22260601:
  M12, 3-pin+ PE, straight M12 plug on 2x straight M12 socket
- 22260602:
  M12, 5-pin straight M12 plug on 2x 3-pin straight M8 socket, parallel distributor
- 22260603:
  M8, 4-pin M8 plug on 2x 3pin M8 socket
- 22260604:
  M8 plug on M8 socket, 3-pin parallel distributor

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Material
Contact: CuZn
Contact surface: Ni/Au
Knurl: Zinc die-cast, nickel-plated
Gripping body: TPU, flame-retardant, self-extinguishing

Protection rating
IP65/IP67

Ambient temperature (operation)
Plug/ socket: -25 °C to +90 °C

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Rated voltage (V)	PU
M12 Y distributor			
22260600	AB-C3-M12Y-2XM12FS B E	60	5
22260601	AB-C3-M12Y-2XM12FS E	60	5
22260602	AB-C5-M12Y-2XM12FS V	60	5
M8 Y distributor			
22260603	AB-C3-M8Y-2XM8FS	30	5
22260604	AB-C3-M8Y-2XM8FS V	60	5

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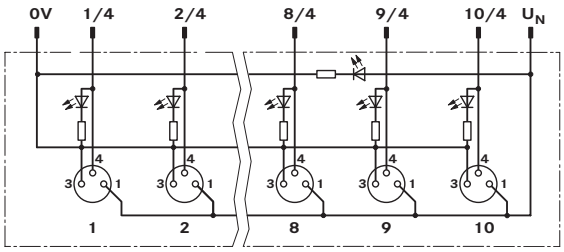
Distribution Box M8

Distribution box with M8 slots and master cable/connection M12/M16



Benefits

- Cost efficient and rational wiring of sensors and actuators
- Instead of numerous individual conductors, one master cable is laid to the control unit
- Hybrid cable for signal and power transmission
- There are no assembly costs as the master cable is already pre-assembled
- Suitable for drag chains

Product features

- Single-occupied boxes
- With fixed master cable or M12/M16 socket
- LEDs indicate the operating mode of the distributor and the status of the sensors
- PWIS-free

Norm references / Approvals

- E-File number: E75770

Product Make-up

- Core insulation: PVC
- Outer sheath: PUR, black

Suitable cables

- M12 master cable
  8-pos. 5/10 m: 22260615/22260616
- M16 master cable
  8-pos 5/10m: 22260607/22260608
  10-pos 5/10m: 22260609/22260610
  12-pos 5/10m: 22260611/22260612
  14-pos 5/10m: 22260613/22260614

Suitable tools

- Suitable tools are available upon request (e.g. M8 torque screwdriver)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002585
ETIM 5.0/6.0 Class-Description: Passive sensor-actuator interface

Protection rating
IP65/IP67

Ambient temperature (operation)
-30°C to +80°C
Fixed installation -40°C to +90°C
Flexing -5°C to 80°C

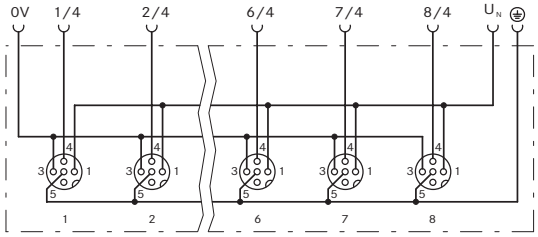
Current rating per slot
2 A

Article number	Article designation	Connection cable (No. of poles)	Length (m)	Number of slots	Status display
Fixed master cable					
22260026	AB-B4-M8L-4-5,0PUR		5	4	With LEDs
22260027	AB-B4-M8L-4-10,0PUR		10	4	With LEDs
22260028	AB-B6-M8L-6-5,0PUR		5	6	With LEDs
22260029	AB-B6-M8L-6-10,0PUR		10	6	With LEDs
22260030	AB-B8-M8L-8-5,0PUR		5	8	With LEDs
22260031	AB-B8-M8L-8-10,0PUR		10	8	With LEDs
22260032	AB-B10-M8L-10-5,0PUR		5	10	With LEDs
22260033	AB-B10-M8L-10-10,0PUR		10	10	With LEDs
M12 connection					
22260038	AB-B4-M8L-4-M12	8		4	With LEDs
22260039	AB-B6-M8L-6-M12	8		6	With LEDs
M16 connection					
22260034	AB-B4-M8L-4-M16	8		4	With LEDs
22260035	AB-B6-M8L-6-M16	10		6	With LEDs
22260036	AB-B8-M8L-8-M16	12		8	With LEDs
22260037	AB-B10-M8L-10-M16	14		10	With LEDs

Copper price basis: inclusive of copper. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Unoccupied slots must be covered with protective caps - ArtNo. 22260606 (M8); 22260605 (M12).

Distribution Box M12

Distribution box with M12 slots and master cable/mountable/M23 connection



Benefits

- Cost efficient and rational wiring of sensors and actuators
- Instead of numerous individual conductors, one master cable is laid to the control unit
- Hybrid cable for signal and power transmission

Product features

- With fixed master cable, mountable or M23 socket
- Single or double-occupied sensor/actuator box
- M12 quick-locking system, optional LED diagnostic
- Suitable for drag chains
- PWIS-free

Norm references / Approvals

- E-File number: E75770

Product Make-up

- Core insulation: PVC
- Outer sheath: PUR, black

Suitable cables

- UNITRONIC® SENSOR master cable Page 96
- M23 connection cable: 10 m: 22260852; 15 m: 22260853; 30 m: 22260959

Suitable tools

- Suitable tools are available upon request (e.g. M12 torque screwdriver)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002585
ETIM 5.0/6.0 Class-Description: Passive sensor-actuator interface

Protection rating
IP65/IP67 (M23 connection)
IP65/IP67/IP69

Ambient temperature (operation)
-25°C to +75°C (M23 connection)
-30°C to +90°C
Fixed installation -40°C to +90°C
Flexing -5 °C bis +80 °C

Max. current rating per path
2 A

Current rating per slot
4 A

Article number	Article designation	Length (m)	Number of slots	Status display
Single-occupied boxes				
Fixed master cable				
22260010	AB-B4-M12-4-5,0PUR	5	4	no
22260011	AB-B4-M12-4-10,0PUR	10	4	no
22260014	AB-B8-M12-8-5,0PUR	5	8	no
22260015	AB-B8-M12-8-10,0PUR	10	8	no
22260018	AB-B4-M12L-4-5,0PUR	5	4	With LEDs
22260019	AB-B4-M12L-4-10,0PUR	10	4	With LEDs
22260970	AB-B6-M12L-6-5,0PUR	5	6	With LEDs
22260022	AB-B8-M12L-8-5,0PUR	5	8	With LEDs
22260023	AB-B8-M12L-8-10,0PUR	10	8	With LEDs
Field mountable				
22260005	AB-B4-M12-4-C		4	no
22260007	AB-B8-M12-8-C		8	no
22260001	AB-B4-M12L-4-C		4	With LEDs
22260003	AB-B8-M12L-8-C		8	With LEDs
M23 connection				
22260618	AB-B6-6-L-M23		6	With LEDs
22260619	AB-B8-8-L-M23		8	With LEDs
Double-occupied boxes				
Fixed master cable				
22260012	AB-B4-M12-8-5,0PUR	5	4	no
22260013	AB-B4-M12-8-10,0PUR	10	4	no
22260016	AB-B8-M12-16-5,0PUR	5	8	no
22260017	AB-B8-M12-16-10,0PUR	10	8	no
22260020	AB-B4-M12L-8-5,0PUR	5	4	With LEDs
22260021	AB-B4-M12L-8-10,0PUR	10	4	With LEDs
22260024	AB-B8-M12L-16-5,0PUR	5	8	With LEDs
22260025	AB-B8-M12L-16-10,0PUR	10	8	With LEDs
Field mountable				
22260006	AB-B4-M12-8-C		4	no
22260008	AB-B8-M12-16-C		8	no
22260002	AB-B4-M12L-8-C		4	With LEDs
22260004	AB-B8-M12L-16-C		8	With LEDs
M23 connection				
22260621	AB-B8-16-M23		8	no
22260620	AB-B8-16-L-M23		8	With LEDs

Copper price basis: inclusive of copper. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Unoccupied slots must be covered with protective caps - ArtNo. 22260606 (M8); 22260605 (M12).
UL certifications can be found in the data sheet.

UNITRONIC® SENSOR M12 Power

Power cable: M12 plug/socket on free conductor

Info

- Other types are available at www.lappgroup.com/assemblyfinder or on request

Benefits

- Cost-effective, efficient wiring of fieldbus and sensor/ actuator installations
- Space-saving due to compact dimensions
- Customise assembly of the free conductor end

Product features

- 4-core power cable
- M12 connector, A-coded with quick-locking system
- Including tag carrier
- Suitable for drag chains
- PWIS-free

Product Make-up

- 4 x 0.75 mm²
- 4-pin: bn (1), wh (2), bu (3), bk (4)
- Core insulation: PVC
- Outer sheath: PUR, black
- Outer diameter: 5.9 mm

Suitable tools

- DATA STRIP stripping tool refer to main catalogue 2018/19

Suitable connectors

- EPIC® SENSOR M12 Page 103

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001855
ETIM 5.0/6.0 Class-Description: Sensor-actuator patch cord

Material
Contact: CuSn
Contact surface: Ni/Au
Knurl: Zinc die-cast, nickel-plated
Gripping body: TPU, flame-retardant, self-extinguishing

Minimum bending radius
Flexing: 10 x outer diameter

Protection rating
IP65/IP67

Ambient temperature (operation)
Plug/socket -25°C to +90°C
Fixed installation -25°C to +80°C
Flexing -5°C to +80°C

Coding
A-standard

Rated current (A)
4 A

Article number	Article designation	Number of pins	Length (m)	Design	Rated voltage (V)	PU
Straight connector						
22260778	AB-PC4-M12MS-2,0PUR	4	2	straight	250	1
22260779	AB-PC4-M12MS-5,0PUR	4	5	straight	250	1
22260780	AB-PC4-M12MS-10,0PUR	4	10	straight	250	1
Straight socket						
22260781	AB-PC4-2,0PUR-M12FS	4	2	straight	250	1
22260782	AB-PC4-5,0PUR-M12FS	4	5	straight	250	1
22260783	AB-PC4-10,0PUR-M12FS	4	10	straight	250	1

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: inclusive of copper. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- FLEXIMARK® Label LMB refer to main catalogue 2018/19

EPIC® POWER M12 60V

Field mountable M12 POWER connectors

Info

- DC high-power connector
  - 60 VDC / 12 A

Benefits

- Compact and standardized M12 design saves space and costs
- Fault proof connection through M12 T coding of the connector face
- Low voltage drop
- Safety use in field environment by high protection class

Application range

- Power Supply for small devices
- Tool shop
- Wiring of machines, tools, devices, appliances and control cabinets
- Suitable for use in measuring, control and regulating circuits

Product features

- Robust M12 circular connector with screw connection and knurled srew
- Screw-on terminals for different conductors

Norm references / Approvals

- UL File Number: E249137

Product Make-up

- PVC single stranded wires, l = 0.2 m (4x AWG16)
- 4-pin: bn (1), wh (2), bu (3), bk (4)
- High quality gold-plated contacts
- For screw contacts: 0,75 mm² - 1,5 mm² (AWG 18 - AWG 16)

Suitable cables

- ÖLFLEX® FD 855 P refer to main catalogue 2018/19
- (ÖLFLEX® FD 855 P: Example for harsh conditions)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Material
Contact: CuZn
Contact surface: Au (gold)
Knurl: Zinc die-cast, nickel-plated
Gripping body: PA

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket -40°C to +85°C

Coding
T - Power

Rated current (A)
12 A

Article number	Article designation	Design	Number of pins	Cable diameter in mm	Rated voltage (V)	PU
EPIC® POWER M12 60V						
Plug						
22262010	AB-C4-M12MST-PG11	straight	4	8.0 - 10.0	60	1
22262012	AB-C4-M12MAT-PG11	angled	4	8.0 - 10.0	60	1
Socket						
22262011	AB-C4-M12FST-PG11	straight	4	8.0 - 10.0	60	1
22262013	AB-C4-M12FAT-PG11	angled	4	8.0 - 10.0	60	1

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ETHERLINE®

Data communication systems for ETHERNET technology

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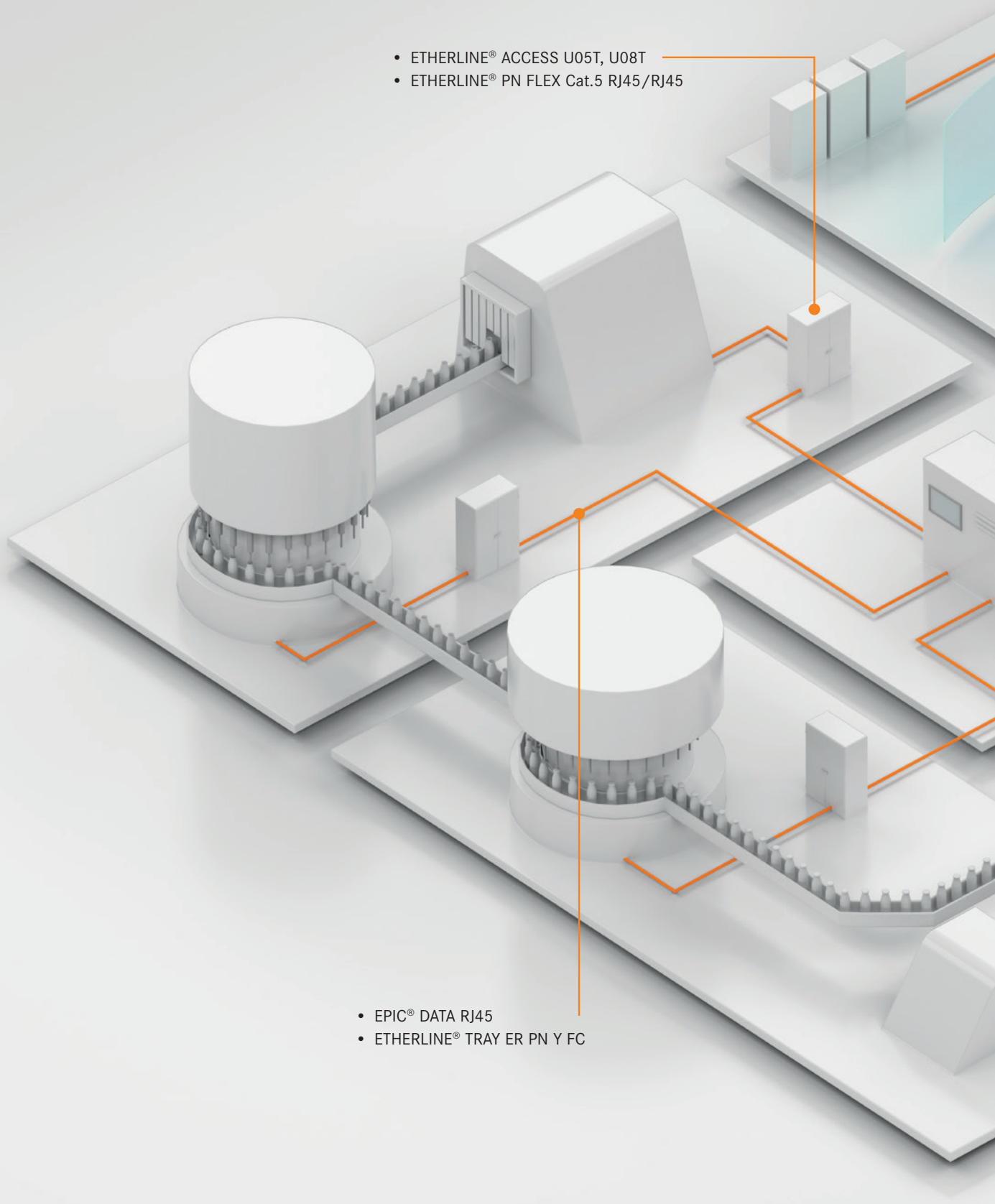
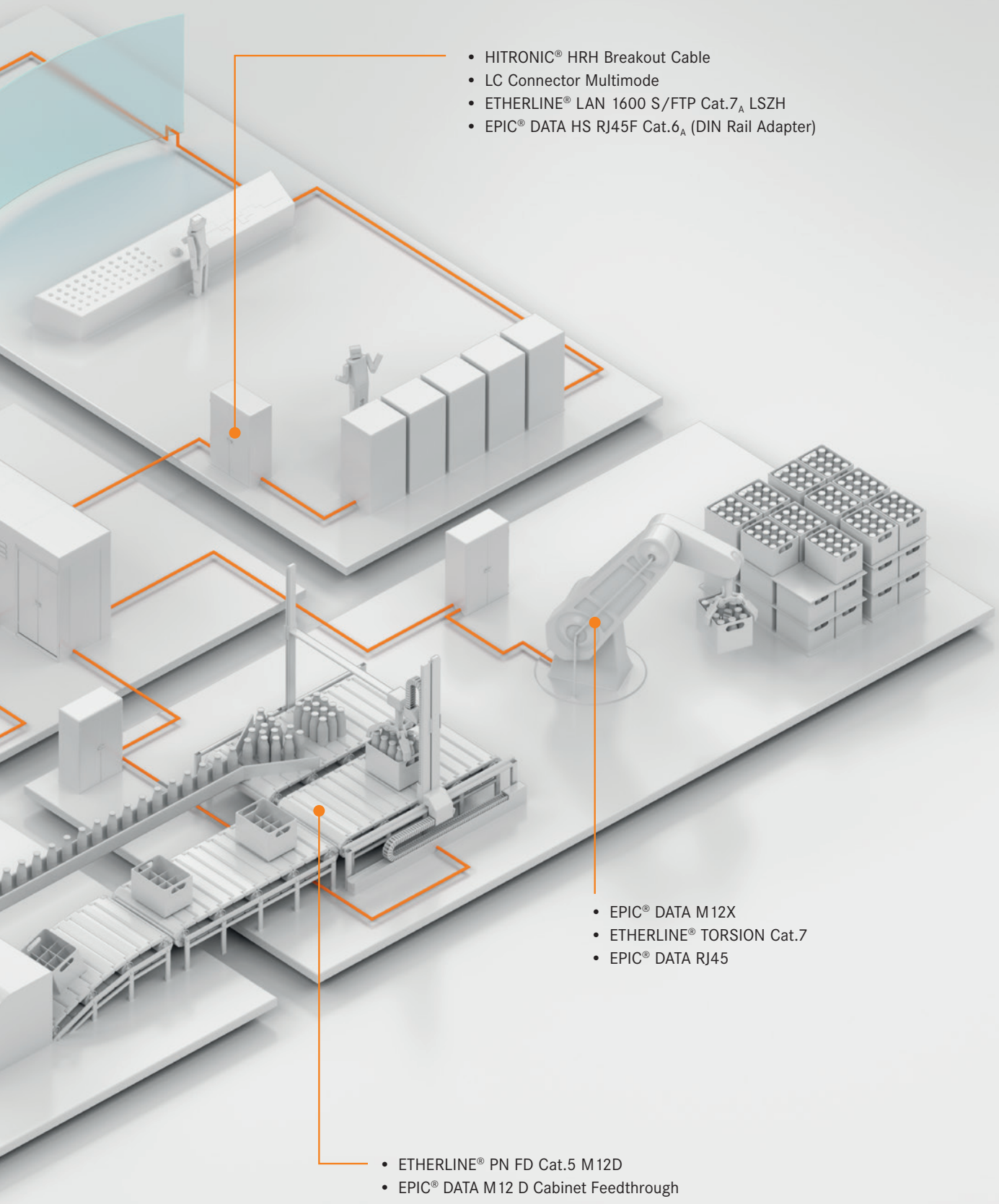




- HITRONIC® HRH Breakout Cable
- LC Connector Multimode
- ETHERLINE® LAN 1600 S/FTP Cat.7_A LSZH
- EPIC® DATA HS RJ45F Cat.6_A (DIN Rail Adapter)

- EPIC® DATA M12X
- ETHERLINE® TORSION Cat.7
- EPIC® DATA RJ45

- ETHERLINE® PN FD Cat.5 M12D
- EPIC® DATA M12 D Cabinet Feedthrough

Data communication systems for ETHERNET technology

Ethernet is the leading standard for computer networks in office buildings. However, due to its widespread availability, reliability, and performance, it is increasingly prevalent in industrial environments as well.

Our ETHERLINE® portfolio offers comprehensive solutions for your Ethernet network. You can always rely on our high-quality products to avoid downtimes and expensive breakdowns.

LAPP places great importance on fitting products and strives to offer the best solution possible for your application. Our large ETHERLINE® portfolio offers solutions for varied applications in industrial environments as well as for structured building cabling. We offer matching field-mountable connectors and pre-assembled patch cables for your applications.

The portfolio is completed by our ETHERLINE® ACCESS-products. These robust, managed and unmanaged switches are the perfect network devices for a demanding and industrial environment. This allows us to provide you with end-to-end solutions from just one source.

Our products are thoroughly tested in our in-house laboratory to ensure that we can provide the quality that you have come to expect from us.

ETHERLINE® –
Industrial Ethernet
- Resilient cabling solutions for demanding industrial Ethernet applications
- Compliance with international standards (e.g. PROFINET®)
- Field-mountable connectors – quick assembly and reliable without special tools
- Pre-assembled patch cables with overmolded connectors

ETHERLINE® LAN –
Structured building cabling
- Cables ranging from Cat.5e up to Cat.7_A
- Transmission frequencies up to 1600MHz
- Office patch cables complying with Cat.6_A
- Field-mountable connectors as well as accessories

ETHERLINE® ACCESS –
Industrial data communication
- Reliable and robust industrial Ethernet switches
- Easy construction of redundant networks with quick reconfiguration time of less than 20 ms
- High quality and availability of industrial networks
- Wide range of diagnosis functions

The solution for all industrial communication systems

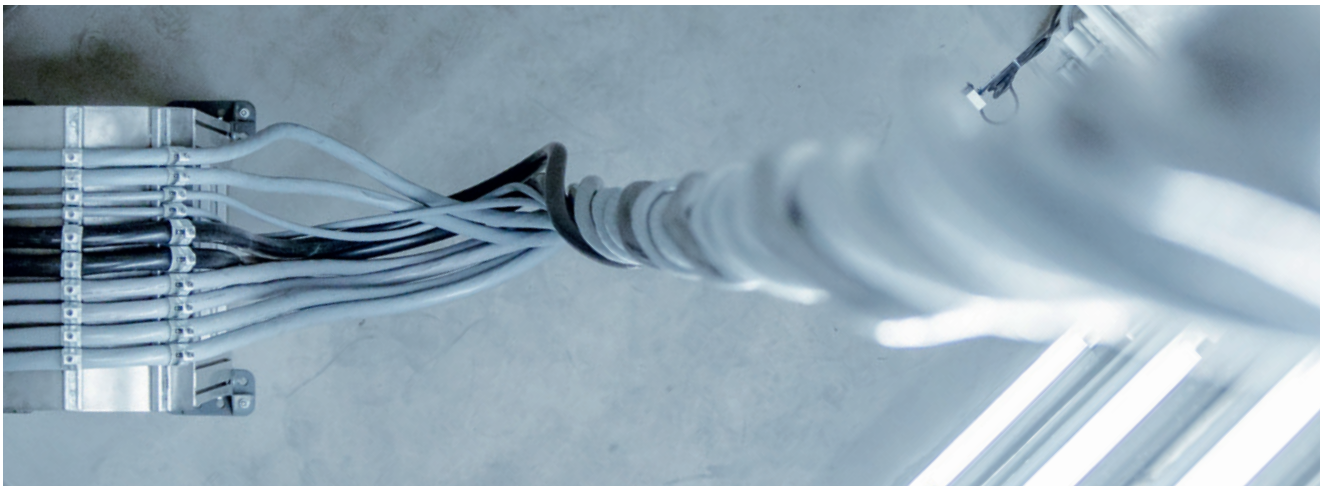
The ETHERLINE® system supports all common industrial Ethernet systems like PROFINET®, EtherNet/IP®, CC-Link® IE or EtherCAT®.

Type specification according to the PROFINET® Guideline
PROFINET® is an international standard for communication systems that defines the cabling within and between production islands. The PROFINET® system specifies copper-based as well as fibre optic transmission media. Its foundation, the 'PROFINET® Cabling and Interconnection Technology Guideline', defines three cable types for copper-based cables. These types specify the exact structure and the mechanical and electrical properties.

Number of pairs / Type of cable	Typ A	Typ B	Typ C
Application	**For fixed installation**	**For flexible Installation**	**For special application**
2-pair (2x2)	AWG22/1	AWG22/7	AWG22/1...19
4-pair (4x2)	min. AWG23/1	min. AWG23/7	min. AWG24/1...19

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Choosing the right cable material



Selection criterion Insulation and sheath materials

Every application makes its own demands of the cabling. The selection of the outer sheath material can be decisive in finding the suitable cable for an application.

To provide an overview of the properties of different sheath materials, the table (below left) lists four typical sheath materials that are used in PROFINET® applications.

The technical tables and the appendix in the LAPP main catalogue provide a detailed overview of all the properties of the ETHERLINE® and HITRONIC® cables. www.lappgroup.com/products

Polyurethane (PUR) is used in cables and wires that are designed for permanent flexing, e. g. in drag chain applications or torsion applications. In this context, these cables must withstand high mechanical loads such as abrasion and lateral pressure.

Polyvinylchloride (PVC) is used in cables and wires that must meet requirements concerning resistance to chemical media or oil-resistance. PVC cables are also highly flame-retardant.

FRNC (flame-retardant non-corrosive) sheath materials are used wherever the absence of halogens is required in the context of a minor release of poisonous flue gas during a fire. These cables are frequently used as installation cables in the building infrastructure.

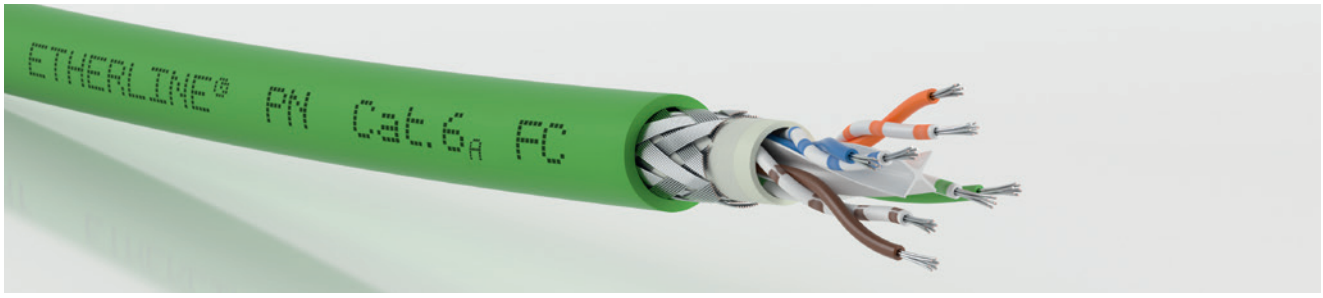
Polyethylene (PE) is normally used as a sheath material for cables that are suitable for direct burial. Further application areas include semi-permanent installation in water or outdoor applications. Together with carbon black (black sheath material), PE provides optimum protection against UV radiation.

Properties of insulation and sheathing of cables and wires

	PUR	PVC	FRNC	PE
Absence of halogens	+	--	+	+
Flame retardance	+	+	+	•
Low flue gas development	•	-	++	-
Low emissions of corrosive gases	•	--	++	•
Low flue gas toxicity	•	-	++	•
Abrasion resistance	++	+	-	•
Stripping	-	+	+	•
Oil-resistance	++	+	-	+
Acids	--	+	+	++

Legend: ++ = very good + = good • = moderate - = low -- = poor

Customized Fast Connect assembly solutions for data rates up to 10 Gbit/s



The challenge

In industrial production and manufacturing environments, ever larger data volumes must be processed within the shortest period of time. This results in increasing requirements for the cabling. This is because the products utilised must not only be designed for steadily growing data rates in the gigabyte range, but also be robust enough to ensure the reliability and operational safety of machines and systems.

The solution

As a systems supplier for connectivity solutions, we know precisely what is required in these situations. We can help you optimise your processes and offer you access to our comprehensive portfolio of innovative Fast Connect data cables. The Fast Connect structure facilitates assembly thanks to a specially-designed internal sheath and a cross separator instead of pair screening. Assembly time is reduced and all of the requirements for shielding and application are optimally fulfilled. There is no need for the time-consuming four-fold removal of the pair screening. With the appropriate tool, it is possible to directly strip down the cable to its twisted pairs. A proficient mechanic can remove both sheaths effortlessly on-site within five seconds.

Incidentally: To ensure faster identification, all of our Fast Connect data cables are marked with “FC” in the article designation.

	Article designation	Sheath material	Temperature range	Feature	Art. no.	Page
fixed installation	ETHERLINE® PN Cat.6$_A$ Y FC 4x2xAWG23/1	PVC, green RAL6018	Fixed: -30 °C to +80 °C	Fast Connect, PROFINET®	2170583	157
	ETHERLINE® PN Cat.6$_A$ FRNC FC 4x2xAWG23/1	PVC, green RAL6018	Fixed: -30 °C to +80 °C	Fast Connect, halogen-free, PROFINET®	2170584	157
	ETHERLINE® PN Cat.6$_A$ P FC 4x2xAWG23/1	PUR, green RAL6018	Fixed: -40 °C to +80 °C	Fast Connect, halogen-free, PROFINET®	2170585	157
flexible	ETHERLINE® PN Cat.6$_A$ Y FLEX FC 4x2xAWG23/7	PUR, green RAL6018	Fixed: -30 °C to +80 °C, Flexing: -30 °C to +75 °C	Fast Connect, PROFINET®	2170586	159
	ETHERLINE® PN Cat.6$_A$ FRNC FLEX FC 4x2xAWG23/7	FRNC, green RAL6018	Fixed: -30 °C to +80 °C, Flexing: -30 °C to +75 °C	Fast Connect, halogen-free, PROFINET®	2170587	159
highly flexible	ETHERLINE® PN Cat.6$_A$ P FD FC 4x2xAWG24/7	PUR, green RAL6018	Fixed: -40 °C to +80 °C, Flexing: -30 °C to +75 °C	Fast Connect, halogen-free, PROFINET®	2170590	*
	ETHERLINE® PN Cat.6$_A$ Y FD FC 4x2xAWG24/7	PVC, green RAL6018	Fixed: -30 °C to +80 °C, Flexing: -30 °C to +75 °C	Fast Connect, PROFINET®	2170591	*

Article designation	Item description	Minimum cable diameter	Maximum cable diameter	Art. no.	Page
EPIC® DATA ED-IE-AXS-6A-B-20-FC	Straight RJ45 connector, as per EIA/TIA 568B	5.5 mm	10.0 mm	21700653	173
EPIC® DATA ED-IE-90-6A-B-20-FC	Straight RJ45 connector, as per EIA/TIA 568B	5.5 mm	10.0 mm	21700637	173
EPIC® DATA ED-IE-AX-M12X-6A-67-FC	Straight M12 X-coded connector	5.0 mm	9.7 mm	21700602	176
EPIC® DATA ED-IE-AX-M12XF-RM-6A-67-FC	Straight M12 X-coded flange coupler	5.0 mm	9.7 mm	21700622	176
FC STRIP VARIO	Stripping tool for Fast Connect cables with adjustable blade spacing	2.5 mm	8.0 mm	21124045	*

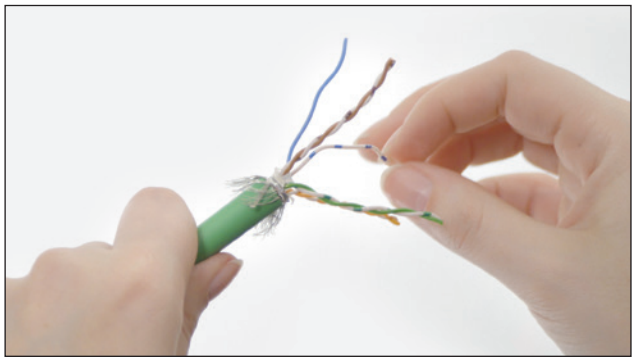
Legend: *see www.lappgroup.com/products

Assembling a Fast Connect cable for PROFINET® Cat.6_A with RJ45

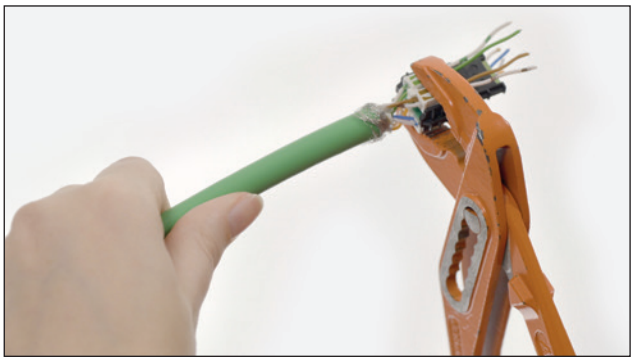
An experienced systems supplier, LAPP is your powerful partner in all aspects of assembly. You can get everything you need from one source: from the cable to the connector to the right tool for the job. All of this, of course, with the first-class quality that our brand provides.

Step 1: Positioning
- Position the FC tool on the cable at least 50 mm from the end
- Close the tool around the cable
- Twist the tool around the cable three times

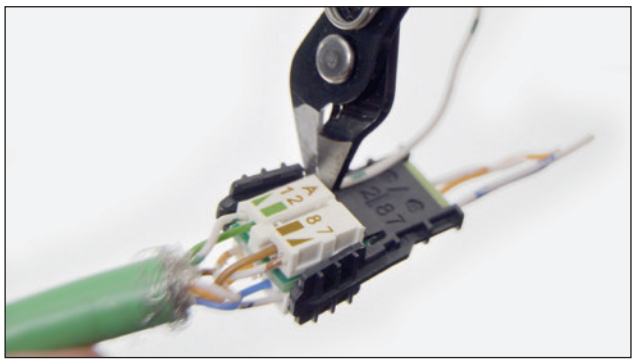
Step 2: Stripping
- Remove the cable insulation using the FC tool
- The braided shield is automatically shortened to 10 mm
- Fold back the braided shield towards the outer sheath



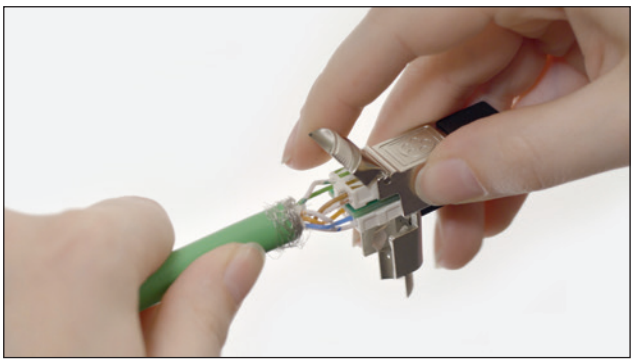
Step 3: Preparing cores
- Sort the core pairs
- Cut the cross-separator as close as possible at the sheath
- Untwist and smooth the core pairs



Step 4: Pressing core manager
- Matching the colours, insert the cores into the core manager
- Slide the core manager as close to the sheath as possible (maximum of 10 mm distance)
- Press the core manager with pliers



Step 5: Preparing connector
- Cut the protruding cores as flush as possible at the core manager
- Remove the installation tool (black plastic sleeve)



Step 6: Inserting core manager
- Insert core manager until the connector can be closed
- Press the half shells together and screw

Quickfinder cable

Automation area	Inst. Area	Category	Application/ cabling	halogenfree	Sheath material	Shielding	AWG	Outer diameter [mm]
Building 4-pairs	Indoor	Cat.5e	static		PVC	U/UTP	4x2xAWG24/1	5.1
						F/UTP	4x2xAWG24/1	6.2
						SF/UTP	4x2xAWG24/1	6.3
				X	LSZH	F/UTP	4x2xAWG24/1	6.3
						SF/UTP	4x2xAWG24/1	6.4
			flexible		PVC	F/UTP	4x2xAWG26/7	5.6
						SF/UTP	4x2xAWG26/7	6.0
				X	LSZH	F/UTP	4x2xAWG26/7	5.6
						SF/UTP	4x2xAWG26/7	6.0
		Cat.6	static		PVC	U/UTP	4x2xAWG24/1	6.0
				X	LSZH	U/UTP	4x2xAWG24/1	6.0
						F/UTP	4x2xAWG23/1	7.4
		Cat.6_A	static		PVC	S/FTP	4x2xAWG23/1	7.3
						F/UTP	4x2xAWG23/1	7.4
				X	LSZH	F/FTP	4x2xAWG23/1	7.3
						F/UTP	4x2xAWG23/1	7.4
		Cat.7	flexible		PVC	S/FTP	4x2xAWG26/7	6.5
				X	LSZH	S/FTP	4x2xAWG26/7	6.2
		Cat.7_A	static	X	LSZH	S/FTP	4x2xAWG23/1	7.5
							2x(4x2xAWG23/1)	2 x 7.5
							4x2xAWG23/1	7.5
							2x(4x2xAWG23/1)	2 x 7.5
							4x2xAWG22/1	8.2
	Outdoor, ground	Cat.7	static		(L)PE	S/FTP	4x2xAWG23/1	9.6
					PE		4x2xAWG23/1	7.7

Automation area	Inst. Area	Category	Application/ cabling	halogenfree	Sheath material	Shielding	AWG	Outer diameter [mm]
Industrial 2-pairs	Indoor	Cat.5e	static	X	H	SF/UTP	2x2xAWG24/1	6.1
					PVC	SF/UTP	2x2xAWG22/1	6.8
							2x2xAWG22/1	6.5
			flexible		PVC	SF/UTP	1x4xAWG26/7	4.8
				X	PUR	SF/UTP	1x4xAWG26/7	4.8
					H	SF/UTP	2x2xAWG26/7	5.9
			high flexible		PVC	SF/UTP	2x2xAWG22/7	6.5
				X	PUR	S/UTP	2x2xAWG26/19	6.2
						SF/UTP	1x4xAWG26/19	4.8
		Cat.5	high flexible	X	PUR	SF/UTP	2x2xAWG22/7	6.8
			torsion	X	PUR	SF/UTP	2x2xAWG22/19	6.8
	Indoor and outdoor	Cat.5	static		PVC	SF/UTP	2x2xAWG22/1	6.8
		Cat.5e	static	X	PUR	SF/UTP	2x2xAWG24/1	6.1
		Cat.5	flexible		PVC	SF/UTP	2x2xAWG22/7	6.8
		Cat.5e	flexible	X	FRNC	SF/UTP	2x2xAWG22/7	6.8
					PVC	SF/UTP	2x2xAWG22/7	6.5
		Cat.5	flexible	X	FRNC	SF/UTP	2x2xAWG22/7	6.5
		Cat.5e	flexible		TPE	SF/UTP	2x2xAWG22/7	6.5
				X	PUR	SF/UTP	2x2xAWG26/7	5.9
	Outdoor and ground	Cat.5	static		PVC/PE	SF/UTP	2x2xAWG22/1	9.8
		Cat.5e	static		PVC/PVC	SF/UTP	2x2xAWG22/1	7.7
Industrial 2-pairs hybrid	Indoor	Cat.5	flexible	X	FRNC	SF/UTP	2x2xAWG22/7 + 4x1.5	10.6

Legend: PN = PROFINET®, cables acc. to PROFINET® standard, *see www.lappgroup.com/products
Please see detailed technical information on the data sheet (www.lappgroup.com/products).

Characteristics	Approvals	Article designation	Article number	Page
		ETHERLINE® LAN 200 Cat.5e U/UTP	2170950	178
		UNITRONIC® LAN 200 Cat.5e F/UTP	2170126	*
		ETHERLINE® LAN 200 Cat.5e SF/UTP	2170951	178
		ETHERLINE® LAN 200 Cat.5e F/UTP LSZH	2170952	178
		ETHERLINE® LAN 200 Cat.5e SF/UTP LSZH	2170953	178
		UNITRONIC® LAN 200 Cat.5e F/UTP FLEX	2170127	184
		UNITRONIC® LAN 200 Cat.5e SF/UTP FLEX	2170129	184
		UNITRONIC® LAN 200 Cat.5e F/UTP LSZH FLEX	2170172	184
		UNITRONIC® LAN 200 Cat.5e SF/UTP LSZH FLEX	2170139	184
Separation cross		ETHERLINE® LAN 350 Cat.6 U/UTP	2170954	179
Separation cross		ETHERLINE® LAN 350 Cat.6 U/UTP LSZH	2170955	179
Separation cross		ETHERLINE® LAN 350 Cat.6 F/UTP LSZH	2170956	179
		ETHERLINE® LAN 500 Cat.6_A S/FTP	2170960	180
Separation cross		ETHERLINE® LAN 500 Cat.6_A F/UTP	2170961	180
		ETHERLINE® LAN 500 Cat.6_A F/FTP LSZH	2170962	180
Separation cross		ETHERLINE® LAN 500 Cat.6_A F/UTP LSZH	2170963	180
		UNITRONIC® LAN 600 Cat.7 S/FTP Y FLEX	2170144	184
		UNITRONIC® LAN 600 Cat.7 S/FTP LSZH FLEX	2170142	184
Up to 1000 MHz		ETHERLINE® LAN 1000 Cat.7_A S/FTP LSZH	2170971	181
Up to 1000 MHz, DUPLEX		ETHERLINE® LAN 1000 Cat.7_A S/FTP LSZH DUPLEX	2170972	181
Up to 1200 MHz		ETHERLINE® LAN 1200 Cat.7_A S/FTP LSZH	2170974	181
Up to 1200 MHz, DUPLEX		ETHERLINE® LAN 1200 Cat.7_A S/FTP LSZH DUPLEX	2170975	181
Up to 1600 MHz		ETHERLINE® LAN 1600 Cat.7_A S/FTP LSZH	2170976	182
PE-AL outer sheath, direct burial		ETHERLINE® LAN 1000 Cat.7 S/FTP (L)PE	2170977	183
PE outer sheath		ETHERLINE® LAN 1000 Cat.7 S/FTP PE	2170978	183

Industrial Ethernet Systems	Characteristics	Approvals	Article designation	Article number	Page
			ETHERLINE® H Cat.5e	2170280	131
PROFINET®, EtherCAT©	Fast Connect	UL/CSA Type PLTC ER	ETHERLINE® TRAY ER PN Y FC	2170879	137
PROFINET®, EtherCAT©		UL/CSA Type CMX	ETHERLINE® PN Cat.5e Y	2170891	157
EtherCAT©		UL/CSA Type CMX	ETHERLINE® Y EC FLEX Cat.5e	2170430	133
EtherCAT©		UL/CSA Type CMX	ETHERLINE® P EC FLEX Cat.5e	2170431	133
			ETHERLINE® H FLEX Cat.5e	2170283	132
PROFINET®, EtherCAT®	Fast Connect	UL/CSA Type CMG	ETHERLINE® FESTOON PN Cat.5e	2170936	131
	Power chain	UL (AWM) 1000 V Rating	ETHERLINE® FD P Cat.5e	2170289	134
EtherCAT©		UL/CSA Type CMX	ETHERLINE® P EC FD Cat.5e	2170433	136
PROFINET®, EtherCAT©	Power chain, Fast Connect	UL/CSA Type CMX, UL (AWM) 1000 V Rating	ETHERLINE® FD P FC Cat.5	2170894	149
PROFINET®, EtherCAT©	Torsion	UL/CSA (AWM)	ETHERLINE® TORSION Cat.5	2170888	150
PROFINET®, EtherCAT©	Fast Connect	UL/CSA Type PLTC and CMG	ETHERLINE® Y FC Cat.5	2170893	143
		UL (AWM) 1000 V Rating	ETHERLINE® P Cat.5e	2170281	131
PROFINET®, EtherCAT©	Fast Connect	UL/CSA Type CMG	ETHERLINE® PN Cat.5 Y FLEX FC	2170886	144
PROFINET®, EtherCAT©	Fast Connect	UL/CSA Type CMG	ETHERLINE® PN Cat.5e FRNC FLEX FC	2170890	144
PROFINET®, EtherCAT©	Black UV res		ETHERLINE® Y Cat.5e BK	2170901	145
PROFINET®, EtherCAT©	Application Marine, Fast Connect	UL/CSA Type PLTC and CMG Germanischer Lloyd, Lloyds Register of Shipping, ABS Europe Ltd Bureau Veritas, Det Norske Veritas (DNV)	ETHERLINE® MARINE FRNC FC	2170889	147
PROFINET®, EtherCAT©	For hollow shaft between gear units and pitch system		ETHERLINE® Cat.5e 105 plus	2170636	146
		UL (AWM) 1000 V Rating	ETHERLINE® P FLEX Cat.5e	2170284	132
PROFINET®, EtherCAT©	Steel armoured, black, UV resistant		ETHERLINE® Cat.5 ARM	2170496	152
PROFINET®, EtherCAT®	Double sheath, black, UV resistant	UL/CSA Type CMG	ETHERLINE® PN Cat.5e YY	2170933	143
PROFINET®	Hybrid	UL (AWM)	ETHERLINE® Cat.5 FRNC HYBRID	2170887	148

Continuation see page 122

Quickfinder cable [Continuation]

Automation area	Inst. Area	Category	Application/ cabling	halogenfree	Sheath material	Shielding	AWG	Outer diameter [mm]
Industrial 4-pairs	Indoor	Cat.5e	static	X	H	SF/UTP	4x2xAWG24/1	6.3
					FRNC	F/UTP	4x2xAWG23/1	8.6
					H/H	SF/UTP	4x2xAWG24/1	6.3/8.3
			flexible	X	H	SF/UTP	4x2xAWG26/7	6.1
					PVC	SF/UTP	4x2xAWG26/7	6.4
	Indoor and outdoor	Cat.5e	static	X	PUR	SF/UTP	4x2xAWG24/1	6.3
			flexible		PUR	SF/UTP	4x2xAWG26/7	6.3
		Cat.5	high flexible	X	PUR	S/UTP	4x2xAWG26/19	6.6
		Cat.5e	high flexible	X	PUR	S/UTP	4x2xAWG26/19	6.1
		Cat.6	high flexible	X	PUR	SF/UTP	4x2xAWG26/19	7.8
	Indoor	Cat.6_A	static		PVC	S/FTP	4x2xAWG22/1	9.0
						SF/UTP	4x2xAWG23/1	8.7
				X	PUR	S/FTP	4x2xAWG22/1	9.0
						SF/UTP	4x2xAWG23/1	8.7
					H	S/FTP	4x2xAWG22/1	9.0
						SF/UTP	4x2xAWG23/1	8.7
			flexible		PVC	S/FTP	4x2xAWG23/7	9.0
						SF/UTP		8.9
				X	FRNC	S/FTP		9.0
						SF/UTP		8.9
			high flexible		PVC	S/FTP	4x2xAWG24/7	9.0
				X	PUR			
			torsion		PVC	S/FTP	4x2xAWG24/7	9.0
				X	PUR			
		Cat.7	static		PVC	S/FTP	4x2xAWG22/1	9.0
							4x2xAWG23/1	8.1
				X	PUR		4x2xAWG22/1	9.0
							4x2xAWG23/1	8.1
					H		4x2xAWG22/1	9.0
							4x2xAWG23/1	8.1
			flexible		PVC	S/FTP	4x2xAWG23/7	8.7
				X	PUR		4x2xAWG26/7	6.4
					H		4x2xAWG23/7	8.7
			torsion	X	PUR	SF/FTP	4x2xAWG24/7	9.4
	Outdoor and ground	Cat.7	static		L(PE)	S/FTP	4x2xAWG23/1	9.6
					PE		4x2xAWG23/1	7.7

ISO/IEC-11801 (2002)	Construction (outdoor/indoor)
U/UTP	**U**nshielded/**U**nshielded **T**wisted **P**air
F/UTP	**F**oiled/**U**nshielded **T**wisted **P**air
S/UTP	**S**creened/**U**nshielded **T**wisted **P**air
SF/UTP	**S**creened+**F**oiled/**U**nshielded **T**wisted **P**air
S/FTP	**S**creened/**F**oiled **T**wisted **P**air

Legend

PN = PROFINET®, cables acc. to PROFINET® standard
*see www.lappgroup.com/products
Please see detailed technical information on the data sheet (www.lappgroup.com/products).

Industrial Ethernet Systems	Characteristics	Approvals	Article designation	Article number	Page
			ETHERLINE® H Cat.5e	2170296	131
	Isolation integrity	PH120 acc. to EN50200	ETHERLINE® FIRE Cat.5e PH120	2170905	168
	Double sheath		ETHERLINE® H-H Cat.5e	2170298	131
			ETHERLINE® H FLEX Cat.5e	2170299	132
		UL/CSA Type CMG	ETHERLINE® Y FLEX Cat.5e	2170486	132
		UL (AWM) 1000 V Rating	ETHERLINE® P Cat.5e	2170297	131
		UL (AWM) 1000 V Rating	ETHERLINE® P FLEX Cat.5e	2170300	132
	Power chain	UL (AWM) 1000 V Rating	ETHERLINE® FD BK Cat.5	CE217489	135
	Power chain	UL (AWM) 1000 V Rating	ETHERLINE® FD P Cat.5e	2170489	134
	Power chain	UL/CSA Type CMX	ETHERLINE® FD P Cat.6	2170488	139
PROFINET®			ETHERLINE® Cat.6_A Y	2170464	156
	Fast Connect	UL/CSA Type CMG, PLTC	ETHERLINE® PN Cat.6_A Y FC	2170583	157
			ETHERLINE® Cat.6_A P	2170465	156
	Fast Connect	UL (AWM)	ETHERLINE® PN Cat.6_A P FC	2170585	157
			ETHERLINE® Cat.6_A H	2170466	156
	Fast Connect	UL/CSA Type CM	ETHERLINE® PN Cat.6_A FRNC FC	2170584	157
PROFINET®		UL/CSA Type CMG	ETHERLINE® PN Cat.6_A Y FLEX	2170930	158
	Fast Connect	UL/CSA Type CMG	ETHERLINE® PN Cat.6_A Y FLEX FC	2170586	159
		UL/CSA Type CMG	ETHERLINE® PN Cat.6_A FRNC FLEX	2170931	158
	Fast Connect	UL/CSA Type CM	ETHERLINE® PN Cat.6_A FRNC FLEX FC	2170587	159
PROFINET®	Power chain	UL/CSA Type CMX	ETHERLINE® FD Cat.6_A	2170485	160
		UL/CSA Type CMX, UL (AWM) 1000 V Rating	ETHERLINE® FD P Cat.6_A	2170484	160
PROFINET®	Torsion	UL/CSA Type CMX	ETHERLINE® TORSION Y Cat.6_A	2170482	161
		UL/CSA Type CMX, UL (AWM) 1000 V Rating	ETHERLINE® TORSION P Cat.6_A	2170483	161
PROFINET®			ETHERLINE® Cat.7 Y	2170474	*
		UL/CSA Type CMG	ETHERLINE® PN Cat.7 Y A	2170605	163
			ETHERLINE® Cat.7 P	2170475	*
		UL (AWM) 1000 V Rating	ETHERLINE® PN Cat.7 P A	2170607	163
			ETHERLINE® Cat.7 H	2170476	*
		UL (AWM)	ETHERLINE® PN Cat.7 FRNC A	2170606	163
PROFINET®		UL/CSA Type CMG	ETHERLINE® PN Cat.7 Y FLEX A	2170608	164
		UL (AWM)	ETHERLINE® Cat.7 FLEX	2170934	142
PROFINET®		UL/CSA Type CM	ETHERLINE® PN Cat.7 FRNC FLEX A	2170609	164
PROFINET®	Torsion	UL/CSA Type CMX	ETHERLINE® TORSION Cat.7	2170481	165
	PE-AL outer sheath, direct burial		ETHERLINE® LAN 1000 Cat.7 S/FTP (L)PE	2170977	183
	PE outer sheath		ETHERLINE® LAN 1000 Cat.7 S/FTP PE	2170978	183

Quickfinder Connector [ETHERLINE® Industrial 4-pairs]

					RJ45						
					Straight, latched				Straight, with cable gland		
			Colour coding		TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A
			Art. no.		21700600	21700601	21700615	21700616	21700652	21700653	21700654
				Page	173	173	173	173	173	173	173
Industrial 4-pairs, Cat.5/Cat.5e	Fixed installation	ETHERLINE® H Cat.5e	2170296	131			X	X			X
		ETHERLINE® FIRE Cat.5e PH120	2170905	168			X	X			X
		ETHERLINE® H-H Cat.5e	2170298	131			X	X			X
		ETHERLINE® P Cat.5e	2170297	131			X	X			X
	Flexible application	ETHERLINE® H FLEX Cat.5e	2170299	132			X	X			X
		ETHERLINE® Y FLEX Cat.5e	2170486	132			X	X			X
		ETHERLINE® P FLEX Cat.5e	2170300	132			X	X			X
		ETHERLINE® HEAT Cat.5e	2170850	167	X	X			X	X	
	Drag chain	ETHERLINE® FD P Cat.5e	2170489	134			X	X			X
	Light & sound technology	ETHERLINE® FD P BK Cat.5	CE217489	135			X	X			X
	Rail sector	ETHERLINE® TRAIN Cat.5e	2170907	166	X	X			X	X	
Industrial 4-pairs, Cat.6/Cat.6$_A$	Fixed installation	ETHERLINE® Cat.6$_A$ Y	2170464	156	X	X			X	X	
		ETHERLINE® Cat.6$_A$ P	2170465	156	X	X			X	X	
		ETHERLINE® Cat.6$_A$ H	2170466	156	X	X			X	X	
		ETHERLINE® HEAT Cat.6$_A$	2170581	167	X	X			X	X	
	Flexible application	ETHERLINE® PN Cat.6$_A$ Y FLEX	2170930	158	X	X			X	X	
		ETHERLINE® PN Cat.6$_A$ FRNC FLEX	2170931	158	X	X			X	X	
	Drag chain	ETHERLINE® FD P Cat.6	2170488	139			X	X			X
		ETHERLINE® FD Cat.6$_A$	2170485	160	X	X			X	X	
		ETHERLINE® FD P Cat.6$_A$	2170484	160	X	X			X	X	
	Torsion	ETHERLINE® TORSION Y Cat.6$_A$	2170482	161	X	X			X	X	
		ETHERLINE® TORSION P Cat.6$_A$	2170483	161	X	X			X	X	
	Rail sector	ETHERLINE® TRAIN FLEX Cat.6$_A$	2170908	166	X	X			X	X	
Industrial 4-pairs, Cat.7	Fixed installation	ETHERLINE® Cat.7 Y	2170474	*	X*	X*			X*	X*	
		ETHERLINE® Cat.7 P	2170475	*	X*	X*			X*	X*	
		ETHERLINE® Cat.7 H	2170476	*	X*	X*			X*	X*	
		ETHERLINE® PN Cat.7 Y A	2170605	163	X*	X*			X*	X*	
		ETHERLINE® PN Cat.7 FRNC A	2170606	163	X*	X*			X*	X*	
		ETHERLINE® PN Cat.7 P A	2170607	163	X*	X*			X*	X*	
	Flexible application	ETHERLINE® HEAT Cat.7	2170582	167	X*	X*			X*	X*	
		ETHERLINE® Cat.7 FLEX	2170934	142			X*	X*			X*
		ETHERLINE® PN Cat.7 Y FLEX A	2170608	164	X*	X*			X*	X*	
		ETHERLINE® PN Cat.7 FRNC FLEX A	2170609	164	X*	X*			X*	X*	
	Burial	UNITRONIC® LAN 1000 S/FTP Cat.7 (L)PE	2170198	*					X*	X*	
		UNITRONIC® LAN 1000 S/FTP Cat.7 PE	2170197	*					X*	X*	
	Food & beverage	ETHERLINE® ROBUST PN Cat.7	2170452	169	X*	X*			X*	X*	
		ETHERLINE® ROBUST Cat.7 FLEX	2170453	169	X*	X*	X*	X*	X*	X*	X*
		ETHERLINE® ROBUST PN FR Cat.7	2170455	170	X*	X*			X*	X*	
		ETHERLINE® ROBUST FR Cat.7 FLEX	2170456	170	X*	X*	X*	X*	X*	X*	X*
	Rail sector	ETHERLINE® TRAIN FLEX Cat.7	2170909	166	X*	X*			X*	X*	

Legende: X = Our recommendation, X* = Transmission properties limited by connector
*see www.lappgroup.com/products

RJ45							M12			Cable coupler
	Angled, with cable gland				RJ45 socket		X-coded, plug	X-coded, socket		Cable coupler round
TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	T 568	T 568	T 568	T 568
21700655	21700636	21700637	21700639	21700640	21700611	21700612	21700602	21700621	21700622	21700623
173	173	173	173	173	175	175	176	176	173	177
X			X	X	X	X	X	X	X	X
X			X	X	X	X	X	X	X	X
X			X	X	X	X	X	X	X	X
X			X	X	X	X	X	X	X	X
X			X	X	X	X	X	X	X	X
X			X	X	X	X	X	X	X	X
X			X	X	X	X	X	X	X	X
	X	X			X	X	X	X	X	X
X			X	X						
X			X	X						
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
X			X	X						
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X	X			X	X	X	X	X	X
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
X*			X*	X*	X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
	X*	X*								
	X*	X*					X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*
X*	X*	X*	X*	X*	X*	X*	X*	X*	X*	X*
	X*	X*			X*	X*	X*	X*	X*	X*

Quickfinder Connector [ETHERLINE® Industrial 2-pairs]

					RJ45							
					Straight, latched					Straight, with cable gland		
			Colour coding		PROFINET®	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	PROFINET®	TIA 568 A	TIA 568 B
			Art. no.		21700605	21700600	21700601	21700615	21700616	21700651	21700652	21700653
				Page	173	173	173	173	173	173	173	173
Industrial 2-pairs, Cat.5/Cat.5e	Fixed installation	ETHERLINE® PN Cat.5e Y	2170891	143	X					X		
		ETHERLINE® Y FC Cat.5	2170893	143	X					X		
		ETHERLINE® Cat.5e YY	2170933	143	X					X		
		ETHERLINE® H Cat.5e	2170280	131				X	X			
		ETHERLINE® P Cat.5e	2170281	131				X	X			
		ETHERLINE® TRAY ER PN Y FC	2170879	143	X					X		
	Flexible application	ETHERLINE® PN Cat.5 Y FLEX FC	2170886	144	X					X		
		ETHERLINE® PN Cat.5e FRNC FLEX FC	2170890	144	X					X		
		ETHERLINE® MARINE FRNC FC Cat.5	2170889	147	X					X		
		ETHERLINE® Y EC FLEX Cat.5e	2170430	133								
		ETHERLINE® P EC FLEX Cat.5e	2170431	133								
		ETHERLINE® H FLEX Cat.5	2170283	132				X	X			
		ETHERLINE® Y Cat.5e BK	2170901	145	X					X		
		ETHERLINE® Cat.5e 105 plus	2170636	146	X					X		
		ETHERLINE® P FLEX Cat.5e	2170284	132				X	X			
	Drag chain	ETHERLINE® FD P FC Cat.5	2170894	149	X					X		
		ETHERLINE® FD P Cat.5e	2170289	134				X	X			
	Burial	ETHERLINE® Cat.5 ARM	2170496	152	X					X		
	Food & beverage	ETHERLINE® ROBUST PN Cat.5	2170451	169	X					X		
		ETHERLINE® ROBUST PN FR Cat.5	2170454	170	X					X		
	Rail sector	ETHERLINE® TRAIN FLEX Cat.5e	2170906	166	X					X		
	Festoon	ETHERLINE® FESTOON PN Cat.5e	2170936	151	X					X		

Legende: X = Our recommendation, X* = Transmission properties limited by connector

RJ45									M12 Circular connector		
Straight, with cable gland		Angled, with cable gland					RJ45 socket		D-coded, socket	D-coded, plug	
TIA 568 A	TIA 568 B	PROFINET®	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568	PROFINET®	TIA 568
21700654	21700655	21700638	21700636	21700637	21700639	21700640	21700611	21700612	22261016	21700647	21700648
173	173	173	173	173	173	173	175	175	176	176	176
		X					X	X	X	X	
		X					X	X	X	X	
		X					X	X	X	X	
X	X				X	X	X	X	X		X
X	X				X	X	X	X	X		X
		X					X	X	X	X	
		X					X	X	X	X	
		X					X	X	X	X	
		X					X	X	X	X	
									X		
									X		
X	X				X	X	X	X	X		X
		X					X	X	X	X	
		X					X	X	X	X	
X	X				X	X	X	X	X		X
		X					X	X	X	X	
X	X				X	X					
		X								X	
		X					X	X	X	X	
		X					X	X	X	X	
		X					X	X	X	X	
		X					X	X	X	X	

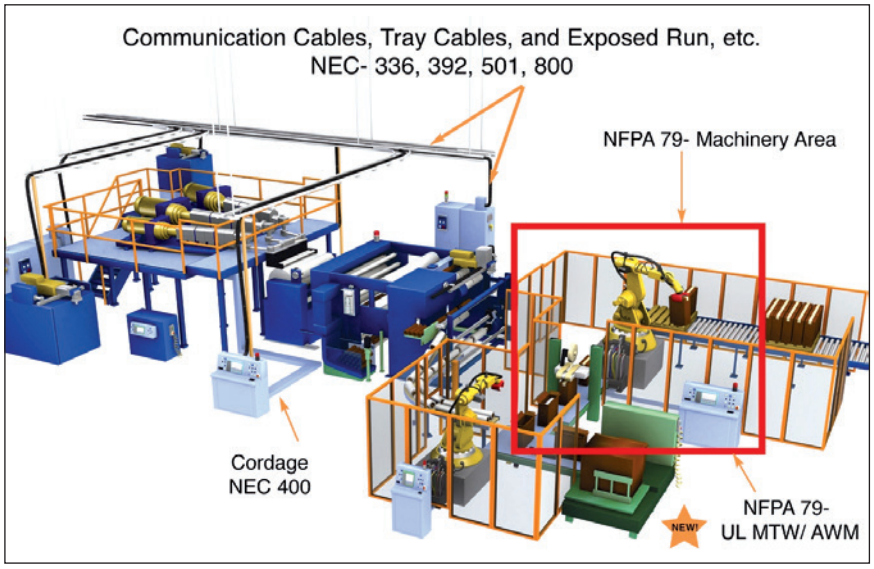
Quickfinder Connector [ETHERLINE® building cabling]

				RJ45			
				Straight, latched			
		Colour coding		TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B
		Art. no.		21700600	21700601	21700615	21700616
			Page	173	173	173	173
Cat.5e	ETHERLINE® LAN 200 F/UTP Cat.5e LSZH	2170952	178	X	X	X	X
	ETHERLINE® LAN 200 SF/UTP Cat.5e LSZH	2170953	178	X	X	X	X
	ETHERLINE® LAN 200 U/UTP Cat.5e	2170950	178			X	X
	ETHERLINE® LAN 200 SF/UTP Cat.5e	2170951	178	X	X	X	X
	UNITRONIC® LAN 200 F/UTP Cat.5e FLEX	2170127	184			X	X
	UNITRONIC® LAN 200 SF/UTP Cat.5e FLEX	2170129	184			X	X
	UNITRONIC® LAN 200 F/UTP Cat.5e LSZH FLEX	2170172	184			X	X
	UNITRONIC® LAN 200 SF/UTP Cat.5e LSZH FLEX	2170139	184			X	X
Cat.6	ETHERLINE® LAN 350 U/UTP Cat.6 LSZH	2170955	179			X	X
	ETHERLINE® LAN 350 F/UTP Cat.6 LSZH	2170956	179	X	X		
	ETHERLINE® LAN 350 U/UTP Cat.6	2170954	179			X	X
$Cat.6_A$	ETHERLINE® LAN 500 F/UTP $Cat.6_A$ LSZH	2170963	180	X	X		
	ETHERLINE® LAN 500 F/FTP $Cat.6_A$ LSZH	2170962	180	X	X		
	ETHERLINE® LAN 500 F/UTP $Cat.6_A$	2170961	180	X	X		
	ETHERLINE® LAN 500 S/FTP $Cat.6_A$	2170960	180	X	X		
Cat.7	UNITRONIC® LAN 600 S/FTP Cat.7 Y FLEX	2170144	184			X*	X*
	UNITRONIC® LAN 600 S/FTP Cat.7 LSZH FLEX	2170142	184			X*	X*
	ETHERLINE® LAN 1000 S/FTP Cat.7 (L)PE	2170977	183				
	ETHERLINE® LAN 1000 S/FTP Cat.7 PE	2170978	183				
$Cat.7_A$	ETHERLINE® LAN 1000 S/FTP $Cat.7_A$ LSZH	2170971	181	X*	X*		
	ETHERLINE® LAN 1200 S/FTP $Cat.7_A$ LSZH	2170974	181	X*	X*		
	ETHERLINE® LAN S/FTP 1600 $Cat.7_A$ LSZH	2170976	182	X*	X*		

Legende: X = Our recommendation, X* = Transmission properties limited by connector

RJ45									
Straight, with cable gland				Angled, with cable gland				RJ45 socket	
TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B	TIA 568 A	TIA 568 B
21700652	21700653	21700654	21700655	21700636	21700637	21700639	21700640	21700611	21700612
173	173	173	173	173	173	173	173	175	175
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
		X	X			X	X	X	X
X	X	X	X	X	X	X	X	X	X
		X	X			X	X	X	X
		X	X			X	X	X	X
		X	X			X	X	X	X
		X	X			X	X	X	X
		X	X			X	X	X	X
X	X			X	X			X	X
		X	X			X	X	X	X
X	X			X	X			X	X
X	X			X	X			X	X
X	X			X	X			X	X
X	X			X	X			X	X
		X*	X*			X*	X*	X*	X*
		X*	X*			X*	X*	X*	X*
X*	X*			X*	X*				
X*	X*			X*	X*			X*	X*
X*	X*			X*	X*			X*	X*
X*	X*			X*	X*			X*	X*
X*	X*			X*	X*			X*	X*

UL approvals for data cables



The figure shows the most important NEC and NFPA codes for an industrial manufacturing facility. Every code involves different requirements for the cables and lines used.

Listed cables & wires
The initial category defines fixed cabling in buildings for residential purposes, as well as commercial and industrial use. Listed cables and wires not only have to meet individual UL product standards, but must also comply with the relevant articles of the National Electrical Code (NEC).

The NEC contains detailed specifications relating to the correct usage of listed cables and wires. The listed cables and wires can be used for factory wiring of electrical equipment, devices, appliances and machinery as well as for on-site or field cabling of industrial machinery and plants according to NFPA 79.

Appliance Wiring Material (AWM)
AWM includes cables and wires intended for the use of electrical equipment, devices, appliances, control cabinets and industrial machinery that are fully wired ex works. AWM is not intended for field wiring purposes. Cables and wires with AWM-style UL labelling must be used for individual applications as stipulated by the relevant style designation. The use of cables with AWM classification is restricted to the applications that are stated in the corresponding description (www.ul.com).

NEC
Article 800 of the NEC dedicates the chapter 'Communication Circuits' to data network cables. This chapter distinguishes between different fire behaviour levels: the higher the level, the higher the requirements relating to fire behaviour. All levels are downward compatible (see table).

Application areas of the respective approvals:
- Plenum: no additional protection in closed cable ducts via suspended ceilings or air supply
- Riser: installation in riser duct between a minimum of two storeys
- General purpose: general applications; standard in machinery and plant engineering
  - CMG/CM: connection of machine or production cell to control cabinet
  - PLTC: metallically protected installation on open cable conduits and between other devices
  - PLTC-ER: free and open installation on cable conduit and between cable conduit and industrial machinery/plant
- Residential: CMX: limited to use within a machine or production cell (automation island)

NEC hierarchy

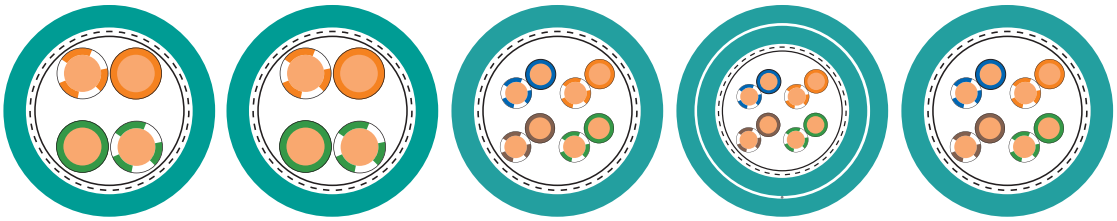
	Communication Cables	Nonconductive Optical Fibre Cables	Conductive Optical Fibre Cables	Tray Cables
Plenum FR-05 NFPA 262, UL910 (Steiner-Tunnel)	CMP	OFNP	OFCP	
Riser FR-04, UL 1666 (Vertical Shaft)	CMR	OFNR	OFCR	
General purpose FR-03, UL 1581 (Vertical Tray or CSA FT4)	CMG CM	OFNG OFN	OFCG OFC	TC-ER TC
Residential FR-02 UL 1581, VW-1 (Vertical Flame)	CMX			

ETHERLINE® Cat.5e

Ethernet cable Category 5e, Class D for fixed installation - verified up to 100 MHz

Info

- Industrial Ethernet cable
- Cat.5e



Benefits

- Seamless communication from the sensor/actuator level to the Internet
- Screened against interference
- Can be used in dry or damp rooms
- Can be used for Industrial Ethernet in harsh industrial environments
- Cables with PUR jacket: 1000 V UL- rating for installation next to power cables

Application range

- 2pair: 10/100 Mbit/s for Industrial Ethernet
- 4pair: 10/100/1000 Mbit/s for Industrial Ethernet
- Suitable for EtherCAT and EtherNet/IP applications
- Industrial use
- Fixed Installation

Product features

- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- PUR outer sheath is highly resistant to mineral oils and abrasion
- Halogen-free outer sheath

Norm references / Approvals

- PUR versions: UL AWM Style 21576
- Flame retardant acc. to IEC 60332-1-2
- Halogen-free according to IEC 60754-1 (amount of halogen acid gas) Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)

Product Make-up

- Solid conductor
- Core insulation made of foam skin
- 2 or 4-pair version
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- Outer sheath as either PUR or LSZH
- Colour: water blue (RAL 5021)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 7.5 x outer diameter (2 pair cable)

Test voltage
Core/core: 1000 V
Core/screen: 500 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
cable with PUR jacket
Fixed installation: VDE -30°C to +80°C; UL/CSA -30°C to +80°C
flexing: VDE -5°C to +50°C; UL/CSA -5°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
2-pair version						
Halogen-free jacket						
2170280	ETHERLINE® H CAT.5e	2 x 2 x AWG24/1	1,0	5.6	22	45
PUR outer sheath, halogen-free						
2170281	ETHERLINE® P CAT.5e	2 x 2 x AWG24/1	1,0	5.8	22	45
4-pair version						
Halogen-free jacket						
2170296	ETHERLINE® H CAT.5e	4 x 2 x AWG24/1	1,0	6.1	32	54
2170298	ETHERLINE® H-H CAT.5e	4 x 2 x AWG24/1	1,0	6.1 / 8.1	32	80
PUR outer sheath, halogen-free						
2170297	ETHERLINE® P CAT.5e	4 x 2 x AWG24/1	1,0	6.1	32	62

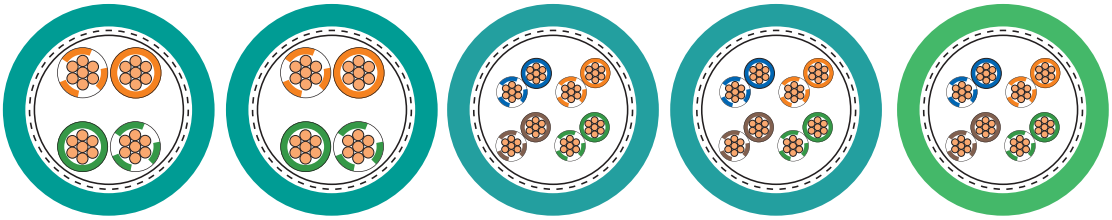
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M8 refer to page 173
- EPIC® DATA HS RJ45F Cat.6A refer to page 175
- EPIC® DATA M12D refer to page 176
- EPIC® DATA M12X refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- EPIC® DATA CCR FA refer to page 177
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® Cat.5e FLEX

Ethernet cable Category 5e, Class D for flexible use - verified up to 100 MHz



Info

- Industrial Ethernet cable
- Cat.5e
- Only for patch cable applications (max. 60 m)

Benefits

- Seamless communication from the sensor/actuator level to the Internet
- Screened against interference
- Can be used in dry or damp rooms
- Can be used for Industrial Ethernet in harsh industrial environments
- Cables with PUR jacket: 1000 V UL- rating for installation next to power cables

Application range

- 2pair: 10/100 Mbit/s for Industrial Ethernet
- 4pair: 10/100/1000 Mbit/s for Industrial Ethernet
- Suitable for EtherCAT and EtherNet/IP applications
- For flexible applications (7-wire stranded conductor)
- Only for patch cable applications (max. 60 m)

Product features

- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- PUR outer sheath is highly resistant to mineral oils and abrasion

Norm references / Approvals

- PVC version with UL/CSA (CMX) certification
- PUR versions: UL AWM Style 21576
- Flame-retardant according IEC 60332-1-2
- Cable with PUR or halogenfree compound: Halogen-free according to IEC 60754-1 (amount of halogen acid gas) Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)

Product Make-up

- Stranded conductor, bare, 7-wire
- Core insulation made of foam skin
- 2 or 4-pair version
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- Outer sheath as either PUR or LSZH
- Colour: water blue (RAL 5021)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 8 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 1000 V
Core/screen: 500 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
cable with PUR jacket
Fixed installation: VDE -30°C to +80°C; UL/CSA -30°C to +80°C
flexing: VDE -5°C to +50°C; UL/CSA -5°C to +80°C
cable halogenfree compound
Fixed installation: -30°C to +80°C
flexing: -5°C to +60°C
cable with PVC jacket
Fixed installation: -40°C to +80°C
flexing: -10°C to +70°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
2-pair version						
Halogen-free jacket						
2170283	ETHERLINE® H Flex CAT.5e	2 x 2 x AWG26/7	1,0	5.6	19	43
PUR outer sheath, halogen-free						
2170284	ETHERLINE® P Flex CAT.5e	2 x 2 x AWG26/7	1,0	5.6	19	45
4-pair version						
Halogen-free jacket						
2170299	ETHERLINE® H Flex CAT.5e	4 x 2 x AWG26/7	1,0	6.1	25	48
PUR outer sheath, halogen-free						
2170300	ETHERLINE® P Flex CAT.5e	4 x 2 x AWG26/7	1,0	6.1	25	54
PVC outer sheath						
2170486	ETHERLINE® Y Flex CAT.5e	4 x2 x AWG26/7	1,0	6.2	30	54

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

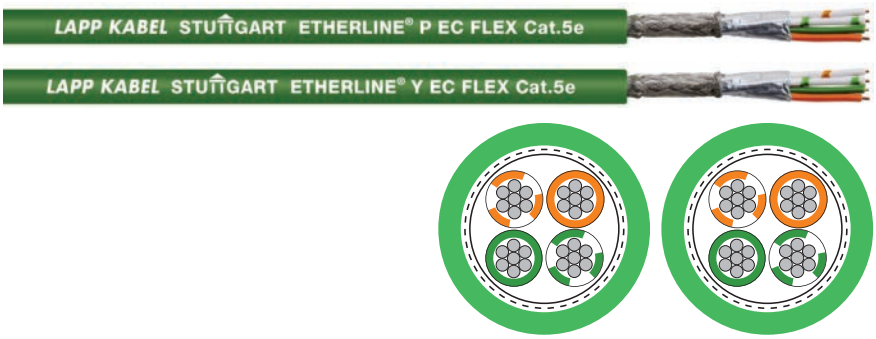
- Field-Terminable Connector RJ45 CAT.5e FM45 refer to main catalogue 2018/19
- EPIC® SENSOR M8 refer to page 173
- EPIC® DATA HS RJ45F Cat.6_A refer to page 175
- EPIC® DATA M12D refer to page 176
- EPIC® DATA M12X refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- EPIC® DATA CCR FA refer to page 177
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® EC FLEX Cat.5e

Flexible use

Info

- For EtherCAT applications
- Cat.5e-Performance
- Only for patch cable applications (max. 60 m)



Benefits

- Can be used for Industrial Ethernet in harsh industrial environments
- Can be used in dry or damp rooms
- Lower space requirement

Application range

- Suitable for EtherCAT and EtherNet/IP applications
- For flexible applications (7-wire stranded conductor)
- Many applications with Industrial Ethernet, i.e. fixed installation and flexible use.
- For internal wiring of electric and electronic equipment in switch cabinets
- Only for patch cable applications (max. 60 m)

Product features

- PUR (Polyurethane) Version with increased robustness, UV- resistance and halogen free
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Norm references / Approvals

- Certification: UL/CSA type CMX in accordance with UL 444 and CSA C22.2 no. 214
- Flame-retardant according to UL VW1/ CSA FT1

Product Make-up

- Stranded tinned 7-wire conductor
- Core insulation: PE
- Insulation colour-codes: orange/white-orange; green/white-green
- Star quad
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- PVC or PUR jacket material
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
max. 100 V (not for power applications)

Minimum bending radius
Fixed installation: 4 x outer diameter
Moved: 8 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Cable with PVC jacket
Fixed installation: -30°C to +80°C
Flexing: -5°C bis +50°C
Cable with PUR jacket
Fixed installation: -40°C to +80°C
Flexing:-30°C to +50°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PVC outer sheath						
2170430	ETHERLINE® Y EC FLEX Cat.5e	1 x 4 x AWG26/7	1,0	4.8	20	32
PUR outer sheath, halogen-free						
2170431	ETHERLINE® P EC FLEX Cat.5e	1 x 4 x AWG26/7	1,0	4.8	20	31

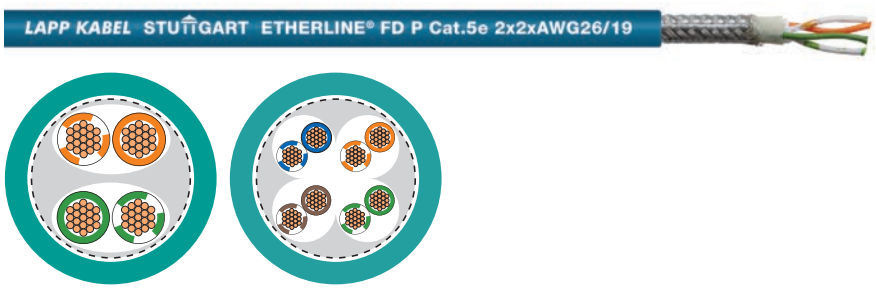
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M8 refer to page 173
- EPIC® DATA HS RJ45F Cat.6_A refer to page 175
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® Cat.5e FD

Ethernet cable Category 5e, Class D for use in drag chain applications - verified up to 100 MHz



Info

- Industrial Ethernet cable
- For highly flexible applications
- Only for patch cable applications (max. 60 m)

Benefits

- Seamless communication from the sensor/actuator level to the Internet
- Screened against interference
- Can be used in dry or damp rooms
- Industrial use
- Cables with PUR jacket: 1000 V UL- rating for installation next to power cables

Application range

- 2pair: 10/100 Mbit/s for Industrial Ethernet
- 4pair: 10/100/1000 Mbit/s for Industrial Ethernet
- Only for patch cable applications (max. 60 m)
- Suitable for EtherCAT and EtherNet/IP applications
- Power chain applications

Product features

- Premium screening against electromagnetic interference
- PUR outer sheath is highly resistant to mineral oils and abrasion
- Halogen-free outer sheath

Norm references / Approvals

- PUR versions: UL AWM Style 21576
- Flame-retardant according IEC 60332-1-2
- Halogen-free according to IEC 60754-1 (amount of halogen acid gas) Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)

Product Make-up

- Bare stranded copper wire, 26AWG (19 x 0.10), (0.14 mm²)
- Inner sheath: thermoplastic elastomer, halogen-free
- 2 or 4-pair version
- Screening: wrapped with braided tinned-copper wires
- PUR outer sheath
- Colour: water blue (RAL 5021)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 8 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 1000 V
Core/screen: 500 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
cable with PUR jacket
Fixed installation: VDE -30°C to +80°C; UL/CSA -30°C to +80°C
flexing: VDE -5°C to +50°C; UL/CSA -5°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
2-pair version						
2170289	ETHERLINE® FD P CAT.5e	2 x 2 x AWG26/19	1,0	5.9	20	48
4-pair version						
2170489	ETHERLINE® FD P CAT.5e	4 x 2 x AWG26/19	1,0	6.3	27	56

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Coil 100 m; Drum (500; 1000) m
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® Cat.5 FD BK

Ethernet cable Category 5e, Class D for installation in events - verified up to 100 MHz

Info

- For highly flexible industrial applications
- Cat.5e-Performance
- Only for patch cable applications (max. 60 m)

Benefits

- Additional application options thanks to suitability for outdoor use, UV-resistant
- Good flexibility - easy installation with tight space requirements
- Screened against interference
- Easy to coil for mobile use

Application range

- IEEE 802.3: 10/100/1000Base-T
  IEEE 802.5: ISDN; FDDI; ATM
- Suitable for the transfer of audio signals (ETHERSOUND), light control signals (DMX over Ethernet), or for computer networking
- Only for patch cable applications (max. 60 m)
- Suitable for EtherCAT and EtherNet/IP applications
- 4pair: 10/100/1000 Mbit/s for Industrial Ethernet

Product features

- Specifically developed for road environments
- Suitable for outdoor use, UV-resistant
- PUR outer sheath is highly resistant to mineral oils and abrasion
- Premium screening against electromagnetic interference

Norm references / Approvals

- UL AWM Style 21576
- Flame retardant acc. to IEC 60332-1-2
- Halogen-free according to IEC 60754-1 (amount of halogen acid gas)
  Corrosiveness of combustion gases according to IEC 60754-2 (degree of acidity)

Product Make-up

- Bare stranded copper wire, 26AWG (19 x 0.10), (0.14 mm²)
- Insulation: foam skin, max. core diameter 1.0 mm
- Twisting: 2 twisted-pair cores, stranding from 4 pairs
- Inner sheath: thermoplastic elastomer, halogen-free
- Screening: wrapped with braided tinned-copper wires
- Outer sheath: halogen-free PUR, black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 10 x outer diameter

Test voltage
Core/core: 1000 V
Core/screen: 500 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
cable with PUR jacket
Fixed installation: VDE -30°C to +80°C; UL/CSA -30°C to +80°C
flexing: VDE -5°C to +50°C; UL/CSA -5°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® Cat.5 FD BK						
CE217489	ETHERLINE® FD P BK Cat.5	4x2xAWG26/19	1,0	6.3	27	54

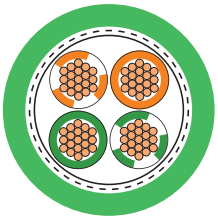
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Standard lengths: (100; 500; 1000) m
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® EC FD Cat.5e

Highly flexible application



Info

- For EtherCAT applications
- For highly flexible industrial applications
- Cat.5e-Performance

Benefits

- Can be used for Industrial Ethernet in harsh industrial environments
- Can be used in dry or damp rooms
- Lower space requirement

Application range

- Suitable for EtherCAT and EtherNet/IP applications
- For highly flexible applications (power chains, moving machine parts)
- Many applications with Industrial Ethernet, e.g. EtherCat, i.e. fixed installation, flexible and highly flexible use
- For internal wiring of electric and electronic equipment in switch cabinets
- Only for patch cable applications (max. 60 m)

Product features

- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Norm references / Approvals

- UL/CSA type CMX in accordance with UL 444 and CSA C22.2 no. 214-02
- Flame-retardant according to UL VW1/ CSA FT1
- Halogen-free according to VDE 0472-815

Product Make-up

- Bare stranded copper wire, 26AWG (19 x 0.10), (0.14 mm²)
- Core insulation: PE
- Insulation colour-codes: orange/white-orange; green/white-green
- Star quad
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- Outer sheath: PUR compound, halogen-free
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
max. 100 V (not for power applications)

Minimum bending radius
Fixed installation: 4 x Outer diameter
Flexing: 16 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -30°C to +50°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® EC FD Cat.5e						
2170433	ETHERLINE® P EC FD Cat.5e	1 x 4 x AWG26/19	1,0	4.8	20	36

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

EtherNet/IP

ETHERLINE® H Flex Cat.5e Patch cables

Info

- Halogen-free and flame-retardant
- Additional variants are available at www.lappgroup.com/assemblyfinder or on request
- Based on 2170283

Benefits

- Non-permanent connections allow for easy change of equipment
- For directly connecting two electric components

Application range

- Suitable for EtherCAT and EtherNet/IP applications
- Suitable for use in industrial applications
- For indoor use
- For flexible applications

Product features

- Meets the requirements according to Cat.5e and class D
- 2 pairs: 10/100 Mbit/s for Industrial Ethernet

Product Make-up

- Braided conductor, 2x2x AWG26/7
- Twisted pair construction permits largely interference-free operation (decoupling).
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: halogen-free, flameretardant compound, 5.6mm in diameter
- Colour: water blue (based on RAL 5021)

Technical data

Classification
ETIM 5.0/6.0: EC002599
Description: Patch cord copper (twisted pair) industry

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 6 x outer diameter

Protection rating
M12: IP 67
RJ45: IP 20

Temperature range
During installation: -5 °C to +60 °C
Fixed installation: -30 °C to +80 °C

Coding
M12: D-Standard

		RJ45	M12, plug, straight	M12, plug, angled	Open end
	Length	**Article number**			
RJ45	1.0m	2171091	2171085	2171878	On request
	2.0m	2171092	2171086	2171879	
	3.0m	2171093	2171087	2171880	
	5.0m	2171094	2171088	2171881	
M12, plug, straight	1.0m	2171085	2171073	On request	2171079
	2.0m	2171086	2171074		2171080
	3.0m	2171087	2171075		2171081
	5.0m	2171088	2171076		2171082
M12, plug, angled	1.0m	2171878	On request	On request	On request
	2.0m	2171879			
	3.0m	2171880			
	5.0m	2171881			

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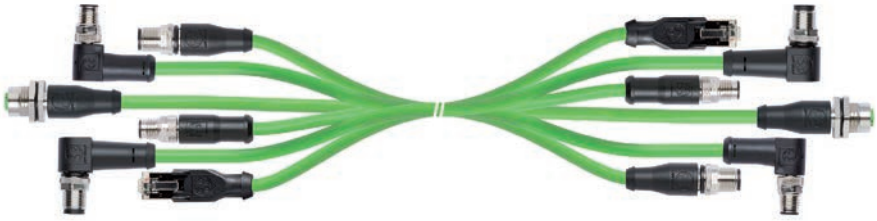
Other lengths are available upon request.

EtherNet/IP

ETHERLINE® EC FD Cat.5e Patch cables



Info

- Suitable for drag chains
- Additional variants are available at www.lappgroup.com/assemblyfinder or on request
- Based on 2170433

Benefits

- Non-permanent connections allow for easy change of equipment
- For directly connecting two electric components

Application range

- Suitable for EtherCAT and EtherNet/IP applications
- Suitable for use in industrial applications
- For indoor use
- For highly flexible applications

Product features

- Meets the requirements according to Cat.5e and class D
- 2 pairs: 10/100 Mbit/s for Industrial Ethernet

Product Make-up

- Braided conductor, 1x4x AWG26/19
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath made of PUR, 4.8mm in diameter
- Colour: green (based on RAL 6018)

Technical data

Classification
ETIM 5.0/6.0: EC002599
Description: Patch cord copper (twisted pair) industry

Minimum bending radius
Flexing: 8 x outer diameter
Fixed installation: 4 x outer diameter

Protection rating
M8: IP 67
M12: IP 67
RJ45: IP 20

Temperature range
During installation: -30°C to +50°C
Fixed installation: -40°C to +80°C

Coding
M8: A-Standard
M12: D-Standard

		RJ45	M12, plug, straight	M12, plug, angled	M12, socket, straight	M8, plug, straight	M8, plug, angled	Open end
	Length	Article number						
RJ45	1.0m	2171765	2171751	2171924	On request	2171758	On request	2171772
	2.0m	2171766	2171752	2171925		2171759		2171773
	5.0m	2171768	2171754	2171927		2171761		2171775
	10.0m	2171769	2171755	2171928		2171762		2171776
M12, plug, straight	1.0m	2171751	2171779	2171786	2171737	2171945	On request	2171793
	2.0m	2171752	2171780	2171787	2171738	2171946		2171794
	5.0m	2171754	2171782	2171789	2171740	2171948		2171796
	10.0m	2171755	2171783	2171790	2171741	2171949		2171797
M12, plug, angled	1.0m	2171924	2171786	2171907	2171744	On request	On request	2171871
	2.0m	2171925	2171787	2171908	2171745			2171872
	5.0m	2171927	2171789	2171910	2171748			2171874
	10.0m	2171928	2171790	2171911	2171749			2171875
M12, socket, straight	1.0m	On request	2171737	2171744	2171916	On request	On request	On request
	2.0m		2171738	2171745	2171917			
	5.0m		2171740	2171747	2171919			
	10.0m		2171741	2171748	2171920			
M8, plug, straight	1.0m	2171758	2171945	On request	On request	2171701	2171719	2171710
	2.0m	2171759	2171946			2171702	2171720	2171711
	5.0m	2171761	2171948			2171704	2171722	2171713
	10.0m	2171762	2171949			2171706	2171724	2171715
M8, plug, angled	1.0m	On request	On request	On request	On request	2171719	2171960	2171728
	2.0m					2171720	2171961	2171729
	5.0m					2171722	2171963	2171731
	10.0m					2171724	2171965	2171733

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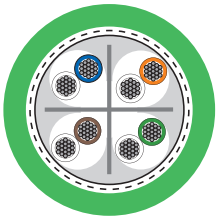
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Other lengths are available upon request.

ETHERLINE® CAT.6 FD

Ethernet cable Category 6, Class E for use in drag chain applications - verified up to 250 MHz

Info

- CAT.6 for drag chain



Benefits

- Highly flexible data cable with PUR outer sheath, meets the highest service life requirements, even under harsh climatic conditions
- Premium screening against electromagnetic interference

Application range

- For use in drag chains and moving machinery parts in dry or damp rooms
- Only for patch cable applications (max. 60 m)
- Suitable for EtherCAT and EtherNet/IP applications
- Plant engineering, machinery manufacturing
- 4pair: 10/100/1000 Mbit/s for Industrial Ethernet

Product features

- PUR outer sheath is resistant to most oils and hydraulic fluids
- CAT.6 for drag chain!
- Min. 1 million bending cycles in the drag chain

Norm references / Approvals

- Flame-retardant according IEC 60332-1-2
- UL/CSA type CMX (UL 444)

Product Make-up

- Stranded conductor, tinned
- AWG 26 (19-wire)
- PP core insulation
- Inner sheath: thermoplastic copolymer (FRNC)
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- PUR outer sheath, halogen-free
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
max. 100 V (not for power applications)

Minimum bending radius
Fixed installation: 4 x outer diameter
Flexing: 7.5 x outer diameter

Test voltage
700 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® CAT.6 FD						
2170488	ETHERLINE® CAT.6 FD	4 x 2 x AWG26/19	1,0	7.8	31.7	63

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® FD Cat.6 Patch cables

Info

- Cat.6 for drag chain, qualified for 10Gbit/s
- Other types are available at www.lappgroup.com/assemblyfinder or on request
- Based on 2170488

Benefits

- Non-permanent connections allow for easy change of equipment
- For directly connecting two electric components

Application range

- Continuous flexing applications
- Suitable for EtherCAT and EtherNet/IP applications
- Suitable for use in industrial applications
- For indoor use

Product features

- Meets the requirements according to Cat.6 and class E
- Suitable for drag chain applications

Product Make-up

- Braided conductor, 4x2x AWG26/19
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath made of PUR, 7.8mm in diameter
- Colour: green (based on RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC002599
ETIM 5.0 Class-Description: Patch cord copper (twisted pair) industry

Minimum bending radius
Flexing: 7.5 x outer diameter
Fixed installation: 4 x outer diameter

Protection rating
IP 67

Temperature range
Flexing: -30°C to +70°C
Fixed installation: -30°C to +80°C

Coding
M12: X-Standard

		M12, plug, straight	M12, socket, straight	Open end
	Length	**Article number**		
M12, plug, straight	1.0m	2172238	2172208	2172247
	2.0m	2172239	2172209	2172248
	3.0m	2172240	2172210	2172249
	5.0m	2172241	2172211	2172250
	10.0m	2172243	2172213	2172252
M12, socket, straight	1.0m	2172208	2172304	2172255
	2.0m	2172209	2172300	2172256
	3.0m	2172210	2172301	2172257
	5.0m	2172211	2172302	2172258
	10.0m	2172213	2172304	2172260

Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Other lengths are available upon request.

EtherNet/IP

NEW

ETHERLINE® Cat.6$_A$ Flex Patch cables

Info

- Additional variants are available at www.lappgroup.com/assemblyfinder or on request
- Based on 2170934

Benefits

- Only for patch cable applications (max. 60m)
- Plug & Play for flexible connection solutions

Application range

- Cat.6$_A$ qualified for 10Gbit/s
- M12 X-coded connectors, comp. with IEC 61076-2-109
- RJ45 connectors, comp. with IEC 60603-7-51

Product features

- Meets the requirements according to Cat.6$_A$ and Class E$_A$

Product Make-up

- Braided conductor, 4x2x AWG26/7
- Twisted pair construction permits largely interference-free operation (decoupling).
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- Outer sheath: PUR compound, halogenfree, 6.4mm in diameter
- Colour: green (based on RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC002599
ETIM 5.0 Class-Description: Patch cord copper (twisted pair) industry

Minimum bending radius
Fixed installation: 4 x outer diameter
Flexing: up from 10 x outer diameter

Protection rating
M12: IP 67
RJ45: IP 20

Temperature range
Flexing: -30°C to +80°C (M12)
Flexing: -40°C to +70°C (RJ45)

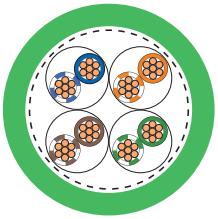
Coding
M12: X-Standard

		RJ45	M12, plug, straight	M12, socket, straight	Open end
	Length	Article number			
RJ45	0.5m	2172362	2172380	2172389	2172371
	1.0m	2172363	2172381	2172390	2172372
	2.0m	2172364	2172382	2172391	2172373
	3.0m	2172365	2172383	2172392	2172374
	5.0m	2172366	2172384	2172393	2172375
	10.0m	2172368	2172386	2172395	2172377
	20.0m	2172370	2172388	2172397	2172379
M12, plug, straight	0.5m	2172380	2172326	2172335	2172317
	1.0m	2172381	2172327	2172336	2172318
	2.0m	2172382	2172328	2172337	2172319
	3.0m	2172383	2172329	2172338	2172320
	5.0m	2172384	2172330	2172339	2172321
	10.0m	2172386	2172332	2172341	2172323
	20.0m	2172388	2172334	2172343	2172325
M12, socket, straight	0.5m	2172389	2172335	2172344	2172353
	1.0m	2172390	2172336	2172345	2172354
	2.0m	2172391	2172337	2172346	2172355
	3.0m	2172392	2172338	2172347	2172356
	5.0m	2172393	2172339	2172348	2172357
	10.0m	2172395	2172341	2172350	2172359
	20.0m	2172397	2172343	2172352	2172361

Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Other lengths are available upon request.

ETHERLINE® Cat.7 FLEX

Ethernet cable for Category 7, class F for flexible use



Info

- Space-saving installation due to small cable diameters
- Cat.7 qualified for 10Gbit/s

Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght for 100 Mbit/s is 60 m max. cable lenght for 10 Gbit/s is 60 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- PUR outer sheath is highly resistant to mineral oils and abrasion
- Robust, halogen-free outer sheath
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Norm references / Approvals

- Electrical requirements acc. to IEC 61156-6
- AWM certification for USA and Canada
- UL AWM Style 21576
- Flame retardant acc. to IEC 60332-1-2
- Halogen free acc. to VDE 0472-815

Product Make-up

- Stranded conductor, bare, 7-wire
- Core insulation made of polyethylene (PE)
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath made of PUR
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Test voltage
Core/core: 1000 V
Core/screen: 500 V

Minimum bending radius
Fixed installation: 4 x outer diameter
Flexing: 10 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6

Temperature range
Fixed installation: -50°C to +80°C
Flexing: -40°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® Cat.7 FLEX						
2170934	ETHERLINE® Cat.7 FLEX	4x2xAWG26/7	1,0	6.4	28	46

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

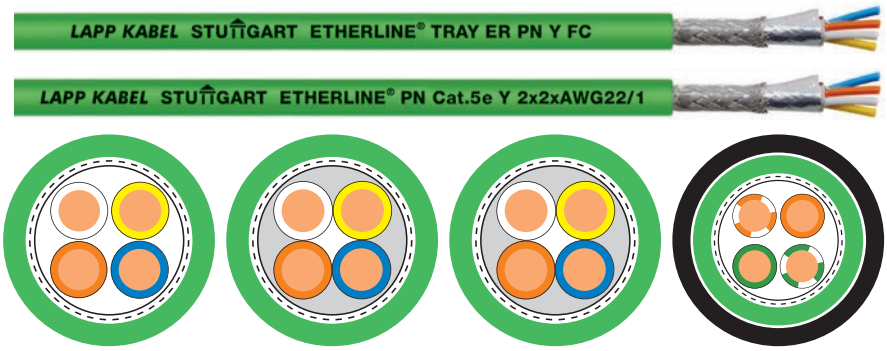
- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177
- KNIPEX Elektronik Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® PN Cat.5

Ethernet cable for Category 5, class D for fixed installation

Info

- CPR: Article number choice under www.lappkabel.com/cpr
- For PROFINET applications type A



Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght für 100 Mbit/s is 100 m
- Suitable for EtherCAT and EtherNet/IP applications
- ETHERLINE® TRAY ER PN Y FC: installation in open cable trays without any conduit

Product features

- Fixed Installation
- CAT.5-Performance
- FC: „Fast Connect“ cable design
- ETHERLINE® Y FC, ETHERLINE® YY, ETHERLINE® TRAY ER PN Y FC : flame-retardant according to CSA FT-4

Norm references / Approvals

- Flame-retardant according IEC 60332-1-2
- ETHERLINE® Y FC with PLTC approbation and AWM Style 21694
- ETHERLINE® PN Cat.5e YY with UL CMG
- ETHERLINE® PN Cat.5e Y with UL CMX
- ETHERLINE® TRAY ER PN Y FC with PLTC ER approval

Product Make-up

- Version for outdoor use: Colour black (similar to RAL 9005)
- Solid bare copper wire AWG22
- Core insulation: PE
- Star quad
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: PVC
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
See data sheet

Test voltage
See data sheet

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
See data sheet

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
conventional cable assembly						
2170891	ETHERLINE® PN Cat.5e Y	1 x 4 x AWG22/1	1.5	6.3	30.4	56
FC: „Fast Connect“ cable design						
2170893	ETHERLINE® Y FC Cat.5	1 x 4 x AWG22/1	1.5	6.5	30.4	70
2170879	ETHERLINE® TRAY ER PN Y FC	1 x 4 x AWG22/1	1.5	6.5	30.4	70
Suitable for outdoor use, UV-resistant						
2170933	ETHERLINE® PN Cat.5e YY	1 x 4 x AWG22/1	1.5	7.7	30.4	62

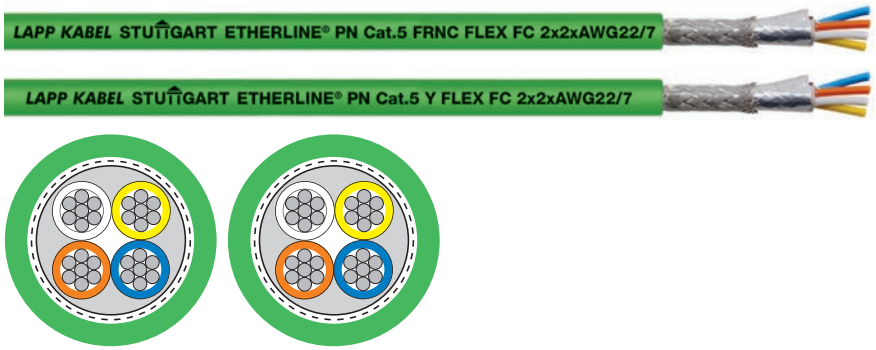
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA RJ45F Cat.6$_A$ refer to page 175
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® PN Cat.5 FLEX

Ethernet cable for Category 5, class D for flexible use



Info

- CPR: Article number choice under www.lappkabel.com/cpr
- For Profinet applications
- Flexible use

Benefits

- For PROFINET applications type B
- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications
- For flexible applications (7-wire stranded conductor)

Product features

- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- CAT.5-Performance
- FRNC Version: Halogene free and flame retardant
- Fast Connect (FC) cable design

Norm references / Approvals

- The cable is UL/CSA-certified (CMG)
- ETHERLINE® PN Cat.5 Y FLEX FC: ECOLAB®
  Industry standard for innovation and efficiency in the field of professionllen cleaning and disinfection

Product Make-up

- Stranded tinned 7-wire conductor
- Core insulation: PE or PP
- Star quad
- Inner sheath made of PVC or FRNC
- Overall screening with copper braid and plastic-laminated aluminium foil
- PVC or FRNC jacket material
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
FRNC cable:
during installation: 8 x outer diameter
fixed: 4 x outer diameter
PVC cable:
Flexing: 7 x outer diameter
Fixed installation: 3 x outer diameter

Test voltage
Core/core: 2000 V
Core/screen: 2000 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
cable halogenfree compound
Fixed installation: -25°C to +80°C
Moved: -25°C to +80°C
cable with PVC jacket
Fixed installation: -40°C to +80°C
Moved: -20°C to +60°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PVC jacket						
2170886	ETHERLINE® PN Cat.5 Y FLEX FC	1 x 4 x AWG22/7	1.5	6.5	31.3	67
FRNC outer sheath						
2170890	ETHERLINE® PN Cat.5e FRNC FLEX FC	1 x 4 x AWG22/7	1.5	6.5	31.2	65

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

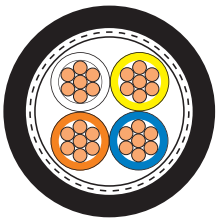
- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA RJ45F Cat.6$_A$ refer to page 175
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® PN Y Cat.5e BK

Flexible application

Info

- For PROFINET applications
- CAT.5-Performance



Benefits

- UV and weather-resistant in black
- Can be used in dry or damp rooms
- Screened against interference
- Suitable for outdoor use, UV-resistant
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- Many applications with Industrial Ethernet, e.g. PROFINET type B, i.e. fixed installation and flexible use.
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- PVC compound TM2 acc. to EN 50363-4-1
- Resistant to acids, alkalis and certain oils at room temperature
- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- Stranded conductor, 7-wire, bare
- Core insulation: Based on Polyolefin
- Colour-coded in accordance with PROFINET for Cat.5 apllications
- Star quad
- Overall screening with copper braid and plastic-laminated aluminium foil
- PVC outer sheath, black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 10 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 1000 V
Core/screen: 500 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Flexing: -10°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® PN Y Cat.5e BK						
2170901	ETHERLINE® Y CAT.5e BK 2x2xAWG22/7	1 x 4 x AWG22/72 x 2 x AWG22/7	6.2	1.5	30.4	59

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

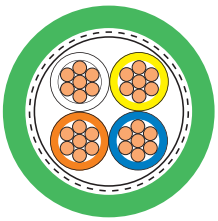
- ETHERLINE® PN FLEX refer to page 144

Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA HS RJ45F Cat.6_A refer to page 175
- EPIC® DATA M12D refer to page 176
- DATA STRIP stripping tool refer to main catalogue 2018/19
- KNIPEX Elektronik Super Knips® refer to main catalogue 2018/19

ETHERLINE® Cat.5e 105 plus

Ethernet cable for Category 5e, class D for flexible use



Info

- For PROFINET applications
- Extended temperature range
- CAT.5-Performance

Benefits

- No need for additional cable protection against high temperatures
- High temperature resistance
- Industrial use
- Premium screening against electromagnetic interference
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- For installation in hollow shaft between gear units and pitch system
- Suitable for fixed installation and occasionally flexible use in high temperature areas
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications
- Wiring of machines, tools, devices, appliances and control cabinets

Product features

- Optimum EMC protection
- Permanent load up to +105°C, temporary load +120°C

Norm references / Approvals

- Electrical requirements acc. to IEC 61156-5
- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- Stranded conductor, 7-wire, bare
- Core insulation: PE
- Colour-coded in accordance with PROFINET for Cat.5 apllications
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath: TPE-based
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
Fixed installation: 10 x outer diameter
Flexing: 15 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Fixed installation: -40°C to +105°C
occasionally flexing: -30°C to +105°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® Cat.5e 105 plus						
2170636	ETHERLINE Cat.5e 105 plus	1 x 4 x AWG22/7	1.5	6.2	30.4	59

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

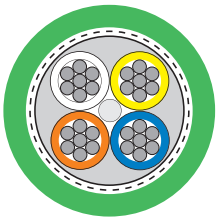
- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA RJ45F Cat.6_A refer to page 175
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® MARINE FRNC FC CAT.5

Flexible application

Info

- Certified for maritime applications
- Flexible use in conjunction with light mechanical stress
- CAT.5-Performance



Benefits

- Can be used for Industrial Ethernet in harsh industrial environments
- For use in dry, damp and wet rooms
- Premium screening against electromagnetic interference
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- Shipbuilding
- Wiring of machines, tools, devices, appliances and control cabinets
- Suitable for EtherCAT and EtherNet/IP applications
- Onshore and offshore applications
- Max. cable lenght für 100 Mbit/s is 85 m

Product features

- Fast Connect (FC) cable design

Norm references / Approvals

- CMG UL/CSA certification 75°C or PLTC, Sun Res
- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- High flame retardancy in accordance with IEC 60332-3 and FT4

Product Make-up

- Fine-wire strand made of tinned-copper wires
- Colour-coded in accordance with PROFINET for Cat.5 apllications
- Star quad
- Inner sheath: thermoplastic copolymer (FRNC)
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- Halogen-free and flame-retardant FRNC outer sheath
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 3 x outer diameter
Flexing: 7.5 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Operating temperature:
-25°C to +70°C
During installation: 0 °C to +50 °C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® MARINE FRNC FC CAT.5						
2170889	ETHERLINE® MARINE FRNC FC CAT.5	1 x 4 x AWG22/7	1.5	6.5	32	68

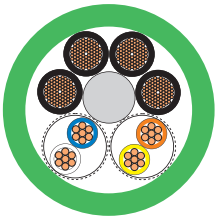
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® Cat.5 FRNC HYBRID

Hybrid cable for ethernet and power transmission



Info

- HYBRID: cable for data transmission + power supply
- CAT.5-Performance

Benefits

- Industrial use
- Screened against interference

Application range

- Industrial Ethernet cable
- 2pair: 10/100 Mbit/s for Industrial Ethernet
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- HYBRID: cable for data transmission + power supply
- Robust, halogen-free outer sheath

Norm references / Approvals

- UL AWM Style 21282
- Flame-retardant according IEC 60332-1-2

Product Make-up

- Cores for Power Supply 4 x 1.5 mm2 (AWG16)
- Data transfer: braided conductor, 7-wire, bare
- Pair screening: wrapped with foil and braided copper wires
- Twisting: data pairs and power supply pairs twisted together
- Overlapping plastic tape
- FRNC outer sheath
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
Occasional flexing: 10 x outer diameter
Fixed installation: 5 x outer diameter

Test voltage
See data sheet

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Operation: -20 °C to +70 °C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Flexible use					
2170887	ETHERLINE® Cat.5 FRNC HYBRID	2x2xAWG22/7 + 4x1.5	10.3	94.2	153

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

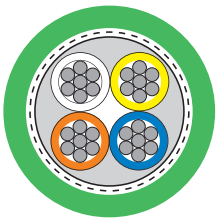
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- STAR STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® PN Cat.5 FD

Highly flexible application

Info

- Highly flexible application
- For PROFINET applications
- CAT.5-Performance



Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- Power chain applications
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- PUR outer sheath is highly resistant to mineral oils and abrasion
- Optimized cable construction for power chain use
- Broad usages due to halogen-free materials

Norm references / Approvals

- UL/CSA type CMX (UL 444)
- Flame retardant acc. to UL CW1 / CSA FT1
- Halogen free acc. to VDE0472-815

Product Make-up

- Fine-wire strand made of tinned-copper wires
- Star quad
- Colour-coded in accordance with PROFINET for Cat.5 apllications
- Inner sheath: thermoplastic copolymer (FRNC)
- Overall screening with copper braid and plastic-laminated aluminium foil
- PUR outer sheath, halogen-free
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
8 x outer diameter

Test voltage
Core/core: 700 V
Core/screen: 700 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Fixed installation: -30°C to +70°C
Flexing: -20°C to +60°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® PN Cat.5 FD						
2170894	ETHERLINE® FD P FC CAT.5	1 x 4 x AWG22/7	1.5	6.5	31.3	61

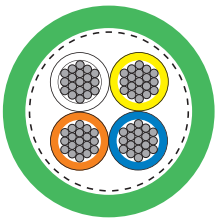
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® TORSION Cat. 5

Ethernet cable for Category 5, class D for highly flexible applications



Info

- Industrial Ethernet Cable, 2-pair, suitable for torsion stress
- For PROFINET applications
- CAT.5-Performance

Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- Industrial Ethernet Cable, 2-pair, suitable for torsion stress
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- Many applications with Industrial Ethernet, e.g. PROFINET, i.e. fixed installation, flexible use as well as TORSION.
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght für 100 Mbit/s is 55 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- Cable suitable for high torsion stress. Tested with more than 1 million bending cycles and a right/left movement of 180° per metre.
- Outer sheath with high abrasion-resistance
- Broad usages due to halogen-free materials
- PUR outer sheath is highly resistant to mineral oils and abrasion

Norm references / Approvals

- UL AWM (Style 21161)
- Halogen-free according to VDE 0472-815
- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- Stranded conductor, tinned
- AWG 22 (19-wire)
- PE core insulation
- Star quad
- Screening: wrapped with braided tinned-copper wires
- Non-woven wrapping
- PUR outer sheath, green (RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
max. 100 V (not for power applications)

Minimum bending radius
Flexing: up from 5 x outer diameter

Test voltage
700 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
-40°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® TORSION Cat. 5						
2170888	ETHERLINE® TORSION CAT.5	1 x 4 x AWG22/19	1.5	6.5	31.3	52

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

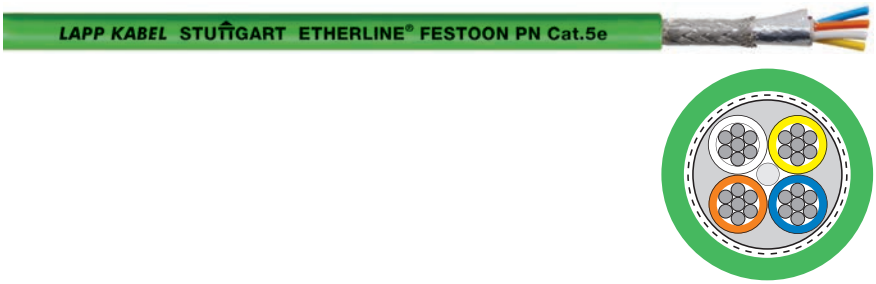
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® FESTOON PN Cat.5e

Ethernet cable for Category 5e, Class D for Festoon applications - verified up to 100 MHz

Info

- Fast and easy cable preparation by FC inner sheath
- For PROFINET applications
- Cat.5e-Performance



Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- For conveying systems and cable trolleys
- Power chain applications
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- Cat.5e-Performance
- Optimized cable construction for use in Festoon applications
- Fast Connect (FC) cable design
- The oil-resistant PVC sheath enables usage in industrial environments

Norm references / Approvals

- The cable is UL/CSA-certified (CMG)
- UL AWM Style 21694
- High flame retardance acc. to IEC 60332-3-24 and FT4

Product Make-up

- Fine-wire strand made of tinned-copper wires
- Star quad
- Colour-coded in accordance with PROFINET for Cat.5e apllications
- Inner sheath: PVC
- Overall screening with copper braid and plastic-laminated aluminium foil
- PVC outer sheath
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Moved: 10 x outer diameter
Fixed installation: 4 x outer diameter

Test voltage
Core/core: 2000 V
Core/screen: 2000 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -10°C to +70°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® FESTOON PN Cat.5e						
2170936	ETHERLINE® FESTOON PN Cat.5e	1 x 4 x AWG22/7	1,5	6.5	32	69

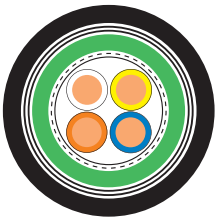
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
UL certifications can be found in the data sheet.

Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- FC STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® Cat.5 ARM

Fixed Installation



Info

- Industrial Ethernet cable
- CAT.5-Performance
- Suitable for outdoor use and direct burial

Benefits

- Can be used for Industrial Ethernet in harsh industrial environments
- EMC-optimised design
- With armouring for improved rodent protection
- Screened against interference
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- Suitable for outdoor use, UV-resistant
- Suitable for direct burial
- Max. cable lenght für 100 Mbit/s is 100 m
- PROFINET application Type C but for fixed installation
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- Fast Connect (FC) cable design

Product Make-up

- Solid and bare copper conductor
- Core insulation: PE
- Colour-coded in accordance with PROFINET for Cat.5 apllications
- Star quad
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- Inner sheath made of PVC (green RAL6018)
  2 layer galvanzid steel tape
- Outer sheath made of black polyethylene (PE)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 10 x outer diameter
Flexing: 15 x outer diameter

Test voltage
Core/core: 2000 V
Core/screen: 2000 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Fixed installation: -40°C to +70°C
Flexing: -20°C to +60°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
Fixed Installation						
2170496	ETHERLINE® Cat.5 ARM	1 x 4 x AWG22/1	1.5	6.5 / 9.3	30.4	124

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Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
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Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
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Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12D refer to page 176
- KNIPEX Electronics Super Knips® refer to main catalogue 2018/19
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® PN Cat.5 Patch cables

Info

- Additional variants are available at www.lappgroup.com/assemblyfinder or on request
- Based on 2170893

Benefits

- Non-permanent connections allow for easy change of equipment

Application range

- For PROFINET® applications type A
- Fixed installation
- Suitable for EtherCAT and EtherNet/IP applications
- Suitable for use in industrial applications
- For indoor use

Product features

- Meets the requirements according to Cat.5e and class D
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Norm references / Approvals

- The cable is UL/CSA-certified (CMG)

Product Make-up

- Solid conductor, 2x2x AWG22/1
- Star quad
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath made of PVC, 6.5mm in diameter
- Colour: green (based on RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC002599
ETIM 5.0 Class-Description: Patch cord copper (twisted pair) industry

Minimum bending radius
During installation: 15 x outer diameter
Fixed installation: 10 x outer diameter

Protection rating
M12: IP 67
RJ45: IP 20

Temperature range
During installation: -20°C to +60°C
Fixed installation: -40°C to +80°C

Coding
M12: D-Standard

		RJ45	M12, plug, straight	M12, plug, angled	M12, socket, straight	Open end
	Length	Article number				
RJ45	1.0m	2171179	2171165	2171172	On request	2171186
	2.0m	2171180	2171166	2171173		2171187
	3.0m	2171181	2171167	2171174		2171188
	5.0m	2171182	2171168	2171175		2171189
	10.0m	2171183	2171169	2171176		2171190
	20.0m	2171184	2171170	2171177		2171191
M12, plug, straight	1.0m	2171165	2171001	2171013	2171151	2171007
	2.0m	2171166	2171002	2171014	2171152	2171008
	3.0m	2171167	2171003	2171015	2171153	2171009
	5.0m	2171168	2171004	2171016	2171154	2171010
	10.0m	2171169	2171005	2171017	2171155	2171011
	20.0m	2171170	2171006	2171018	2171156	2171012
M12, plug, angled	1.0m	2171172	2171013	On request	On request	2171019
	2.0m	2171173	2171014			2171020
	3.0m	2171174	2171015			2171021
	5.0m	2171175	2171016			2171022
	10.0m	2171176	2171017			2171023
	20.0m	2171177	2171018			2171024
M12, socket, straight	1.0m	On request	2171151	On request	On request	On request
	2.0m		2171152			
	3.0m		2171153			
	5.0m		2171154			
	10.0m		2171155			
	20.0m		2171156			

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Other lengths are available upon request.

ETHERLINE® PN Flex Cat.5 Patch cables

Info

- Additional variants are available at www.lappgroup.com/assemblyfinder or on request
- Based on 2170886

Benefits

- Non-permanent connections allow for easy change of equipment
- For directly connecting two electric components

Application range

- For PROFINET® applications type B
- Flexible applications
- Suitable for EtherCAT and EtherNet/IP applications
- Suitable for use in industrial applications
- For indoor use

Product features

- Meets the requirements according to Cat.5e and class D
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Norm references / Approvals

- The cable is UL/CSA-certified (CMG)

Product Make-up

- Braided conductor, 2x2x AWG22/7
- Star quad
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath made of PVC, 6.5mm in diameter
- Colour: green (based on RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC002599
ETIM 5.0 Class-Description: Patch cord copper (twisted pair) industry

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 10 x outer diameter

Protection rating
M12: IP 67
RJ45: IP 20

Temperature range
Flexing: -20°C to +60°C
Fixed installation: -40°C to +80°C

Coding
M12: D-Standard

		RJ45	M12, plug, straight	M12, plug, angled	M12, socket, straight	Open end
	Length	Article number				
RJ45	0.5m	2171228	2171214	2171221	2171293	2171235
	1.0m	2171229	2171215	2171222	2171294	2171236
	2.0m	2171230	2171216	2171223	2171295	2171237
	5.0m	2171232	2171218	2171225	2171297	2171239
	10.0m	2171233	2171219	2171226	On request	2171240
M12, plug, straight	0.5m	2171214	2172192	2172196	2171200	2172194
	1.0m	2171215	2171025	2171037	2171201	2171031
	2.0m	2171216	2171026	2171038	2171202	2171032
	5.0m	2171218	2171028	2171040	2171204	2171034
	10.0m	2171219	2171029	2171041	2171205	2171035
M12, plug, angled	0.5m	2171221	2172196	On request	On request	2172198
	1.0m	2171222	2171037			2171043
	2.0m	2171223	2171038			2171044
	5.0m	2171225	2171040			2171046
	10.0m	2171226	2171041			2171047
M12, socket, straight	0.5m	2171293	2171200	On request	On request	On request
	1.0m	2171294	2171201			
	2.0m	2171295	2171202			
	5.0m	2171297	2171204			
	10.0m	On request	2171205			

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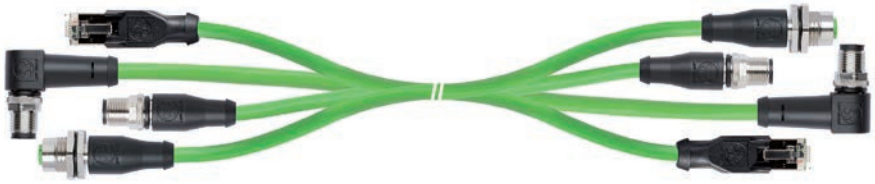
Other lengths are available upon request.

ETHERLINE® PN FD Cat.5 Patch cables

Info

- Additional variants are available at www.lappgroup.com/assemblyfinder or on request
- Based on 2170894



Benefits

- For directly connecting two electric components
- Non-permanent connections allow for easy change of equipment

Application range

- For PROFINET® applications type C
- Continuous flexing applications
- Suitable for EtherCAT and EtherNet/IP applications
- Suitable for use in industrial applications
- For indoor use

Product features

- Meets the requirements according to Cat.5e and class D
- 2pair: 10/100 Mbit/s for Industrial Ethernet

Norm references / Approvals

- The cable is UL/CSA-certified (CMX)

Product Make-up

- Braided conductor, 2x2x AWG22/7
- Star quad
- Overall screening with copper braid and plastic-laminated aluminium foil
- Outer sheath made of PUR , 6.5mm in diameter
- Colour: green (based on RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC002599
ETIM 5.0 Class-Description: Patch cord copper (twisted pair) industry

Minimum bending radius
Flexing: 8 x outer diameter
Fixed installation: 5 x outer diameter

Protection rating
M12: IP 67
RJ45: IP 20

Temperature range
Flexing: -20°C to +60°C
Fixed installation: -30°C to +70°C

Coding
M12: D-Standard

		RJ45	M12, plug, straight	M12, plug, angled	M12, socket, straight	Open end
		Length	Article number			
RJ45	0.5m	2171278	2171264	2171271	On request	2171285
	1.0m	2171279	2171265	2171272		2171286
	2.0m	2171280	2171266	2171273		2171287
	3.0m	2171281	2171267	2171274		2171288
	5.0m	2171282	2171268	2171275		2171289
	10.0m	2171283	2171269	2171276		2171290
M12, plug, straight	0.5m	2171264	2171121	2171122	2171250	2172201
	1.0m	2171265	2171049	2171061	2171251	2171055
	2.0m	2171266	2171050	2171062	2171252	2171056
	3.0m	2171267	2171051	2171063	2171253	2171057
	5.0m	2171268	2171052	2171064	2171254	2171058
	10.0m	2171269	2171053	2171065	2171255	2171059
M12, plug, angled	0.5m	2171271	2171122	On request	2171257	2172204
	1.0m	2171272	2171061		2171258	2171067
	2.0m	2171273	2171062		2171259	2171068
	3.0m	2171274	2171063		2171260	2171069
	5.0m	2171275	2171064		2171261	2171070
	10.0m	2171276	2171065		2171262	2171071
M12, socket, straight	0.5m	On request	2171250	2171257	On request	On request
	1.0m		2171251	2171258		
	2.0m		2171252	2171259		
	3.0m		2171253	2171260		
	5.0m		2171254	2171261		
	10.0m		2171255	2171262		

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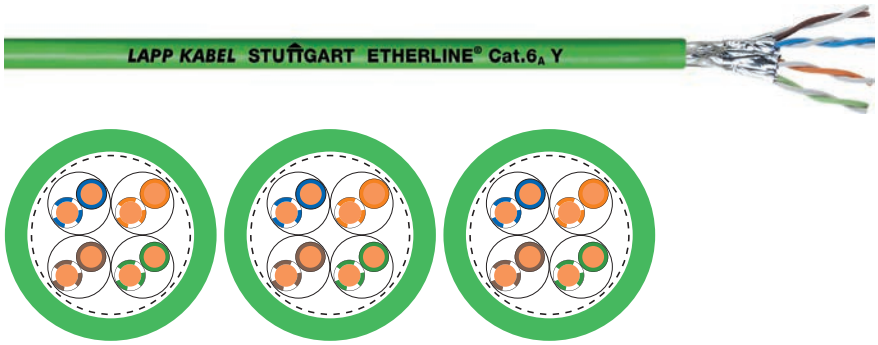
Other lengths are available upon request.

ETHERLINE® Cat.6$_A$

Ethernet cable Category 6$_A$, Class E$_A$ for fixed installation - verified up to 500 MHz



Info

- CPR: Article number choice under www.lappkabel.com/cpr
- For PROFINET applications with 4 pairs
- CAT.6$_A$ qualified for 10Gbit/s

Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght for 100 Mbit/s up to 10 Gbit/s is 100 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- PUR outer sheath is highly resistant to mineral oils and abrasion
- Robust, halogen-free outer sheath
- The oil-resistant PVC sheath enables usage in industrial environments
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Product Make-up

- Solid bare copper wire AWG22
- Core insulation made of polyethylene (PE)
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 10 x outer diameter

Characteristic impedance
100 ± 5 Ω (> 1 MHz)

Temperature range
Cable with PUR sheath
Fixed installation: -40°C to +80°C
Cable, halogen-free outer sheath
Fixed installation: -25°C to +80°C
Cable with PVC sheath
Fixed installation: -30°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
PVC jacket						
2170464	ETHERLINE® PN CAT.6$_A$ Y FC	4x2xAWG22/1	8.7	1,5	53	98
Halogen-free jacket						
2170466	ETHERLINE® PN CAT.6$_A$ FRNC FC	4x2xAWG22/1	8.7	1,5	53	91
PUR outer sheath, halogen-free						
2170465	ETHERLINE® PN CAT.6$_A$ P FC	4x2xAWG22/1	8.7	1,5	53	99

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA RJ45F Cat.6$_A$ refer to page 175
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177
- DATA STRIP stripping tool refer to main catalogue 2018/19

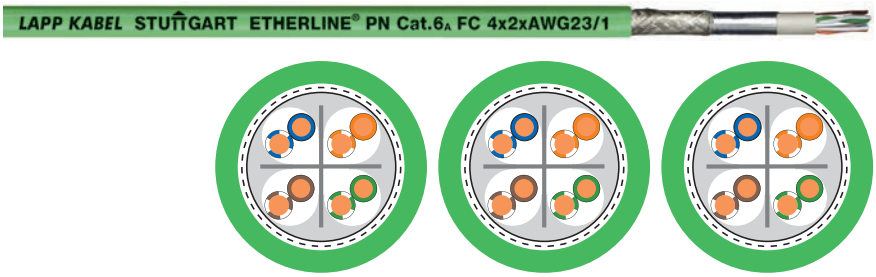
NEW

ETHERLINE® PN Cat.6$_A$ FC

Ethernet cable Category 6$_A$, Class E$_A$ for fixed installation with FC inner sheath - verified up to 500 MHz

Info

- Fast and easy cable preparation by FC inner sheath
- For PROFINET applications with 4 pairs
- CAT.6$_A$ qualified for 10Gbit/s



Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght for 100 Mbit/s up to 10 Gbit/s is 100 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- The oil-resistant PVC sheath enables usage in industrial environments
- Robust, halogen-free FRNC outer sheath
- PUR outer sheath is highly resistant to mineral oils and abrasion
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Norm references / Approvals

- PVC version with PLTC approval and UL CMG listingPUR version with UL AWM Style 21576
- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- Solid bare copper wire AWG23
- Core insulation made of polyethylene (PE)
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening, 2 cores stranded to pair, 4 pairs stranded to bundle with central cross
- Inner sheath: halogen-free compound
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 8 x outer diameter

Test voltage
see datasheet

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
cable with PUR jacket
Fixed installation: VDE -30°C to +80°C; UL/CSA -30°C to +80°C
flexing: VDE -5°C to +50°C; UL/CSA -5°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)
PVC jacket					
2170583	ETHERLINE® PN CAT.6$_A$ Y FC	4x2xAWG23/1	8.7	1.1	53
Halogen-free jacket					
2170584	ETHERLINE® PN CAT.6$_A$ FRNC FC	4x2xAWG23/1	8.7	1.1	53
PUR outer sheath, halogen-free					
2170585	ETHERLINE® PN CAT.6$_A$ P FC	4x2xAWG23/1	8.7	1.1	53

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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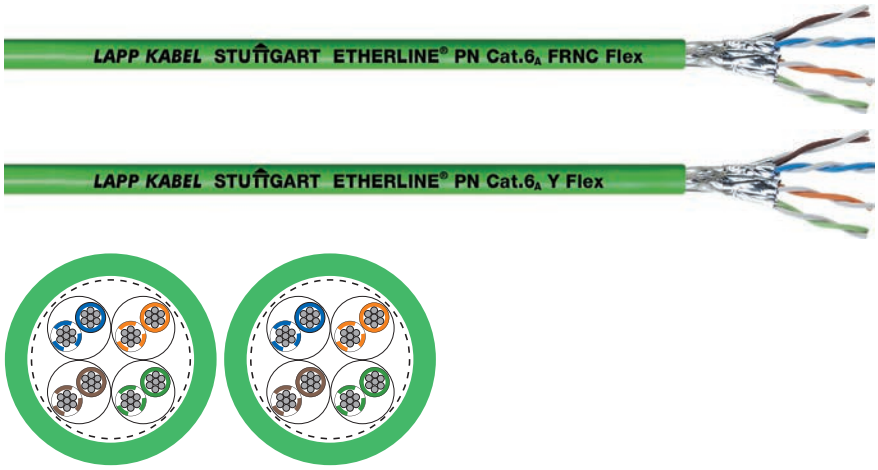
Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA RJ45F Cat.6$_A$ refer to page 175
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177
- FC STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® PN Cat.6$_A$ FLEX

Flexible use



Info

- For PROFINET applications with 4 pairs
- CAT.6$_A$ qualified for 10Gbit/s

Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- At 100 Mbit/s: max 90 m cable length
- Wiring of machines, tools, devices, appliances and control cabinets
- Suitable for EtherCAT and EtherNet/IP applications
- For flexible applications (7-wire stranded conductor)

Product features

- CAT.6$_A$ for flexible application, qualified for 10Gbit/s
- Meets the requirements according to CAT.6$_A$, ISO/IEC 11801 and EN 50173
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- The oil-resistant PVC sheath enables usage in industrial environments

Norm references / Approvals

- UL approvals see datasheet
- ETHERLINE® PN Cat.6$_A$ Y FLEX: ECOLAB® Industry standard for innovation and efficiency in the field of professionllen cleaning and disinfection

Product Make-up

- 7-wire tinned stranded copper conductor
- Core insulation: PE
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- PVC or FRNC jacket material
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 8 x outer diameter

Characteristic impedance
nom. 100 Ω nach IEC 61156-5

Temperature range
cable halogenfree compound
Fixed installation: -25°C to +80°C
cable with PVC jacket
Fixed installation: -40°C to +80°C
Gelegentlich bewegt: -10°C bis +70°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)
PVC Außenmantel					
2170930	ETHERLINE® PN CAT.7 Y FLEX	4x2xAWG23/7	8,8	1,5	48
Halogenfreier Außenmantel					
2170931	ETHERLINE® PN CAT.7 FRNC FLEX	4x2xAWG23/7	8,8	1,5	48

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA RJ45F Cat.6$_A$ refer to page 175
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177
- DATA STRIP stripping tool refer to main catalogue 2018/19

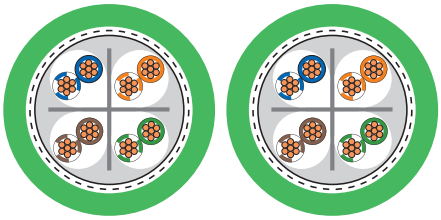
NEW

ETHERLINE® PN Cat.6$_A$ FLEX FC

Ethernet cable Category 6$_A$, Class E$_A$ for flexible use with FC inner sheath - verified up to 500 MHz

Info

- For PROFINET applications with 4 pairs
- CAT.6$_A$ qualified for 10Gbit/s
- Fast and easy cable preparation by FC inner sheath



Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Max. cable lenght for 100 Mbit/s up to 10 Gbit/s is 100 m
- Wiring of machines, tools, devices, appliances and control cabinets
- Suitable for EtherCAT and EtherNet/IP applications
- For flexible applications (7-wire stranded conductor)

Product features

- CAT.6$_A$ for flexible application, qualified for 10Gbit/s
- Meets the requirements according to CAT.6$_A$, ISO/IEC 11801 and EN 50173
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- The oil-resistant PVC sheath enables usage in industrial environments
- Robust, halogen-free FRNC outer sheath

Norm references / Approvals

- UL approvals see datasheet
- Flame retardant acc. to IEC 60332-1-2

Product Make-up

- 7-wire bare stranded copper conductor
- Core insulation: PE
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening, 2 cores stranded to pair, 4 pairs stranded to bundle with central cross
- Inner sheath: halogen-free compound
- PVC or FRNC jacket material
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Flexing: 8 x outer diameter
Fixed installation: 4 x outer diameter

Test voltage
Core/Core: 1500 V AC
Core/Screen: 1000 V AC

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
PVC: fixed: -30 °C up to +80 °C
moving: -25 °C up to +70 °C
FRNC: fixed: -25 °C up to +80 °C
moved: -25 up to +80 °C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)
PVC jacket					
2170586	ETHERLINE® PN CAT.6$_A$ Y FLEX FC	4x2xAWG23/7	8.9	1,5	57
Halogen-free jacket					
2170587	ETHERLINE® PN CAT.6$_A$ FRNC FLEX FC	4x2xAWG23/7	8.9	1,5	57

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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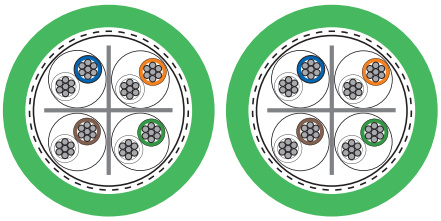
Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA RJ45F Cat.6$_A$ refer to page 175
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177
- DATA STRIP stripping tool refer to main catalogue 2018/19

ETHERLINE® FD CAT.6$_A$

Ethernet cable Category 6$_A$, Class E$_A$ for highly flexible use with FC inner sheath - verified up to 500 MHz



Info

- CAT.6$_A$ for drag chain, qualified for 10Gbit/s
- For PROFINET applications with 4 pairs

Benefits

- For use in power chains and moving machinery parts in dry or damp rooms
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet
- Premium screening against electromagnetic interference
- Can be used for Industrial Ethernet in harsh industrial environments

Application range

- For highly flexible applications (e.g. power chains)
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght für 100 Mbit/s is 85 m
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- PUR version is halogen-free according to IEC 60754
- CAT.6$_A$ for drag chain, qualified for 10Gbit/s
- Meets the requirements according to CAT.6$_A$, ISO/IEC 11801 and EN 50173
- Min. 2.5 million bending cycles in the power chain

Norm references / Approvals

- Electrical requirements acc. to IEC 61156-6
- PUR cable is UL/CSA-certified (CMX)
- PUR versions: UL AWM Style 21576
- PVC cable is UL/CSA-certified (CM)
- Flame retardant acc. to IEC 60332-1-2
- Oil-resistant acc. IEC 60811-2-1

Product Make-up

- 7-wire tinned stranded copper conductor
- Core insulation: Based on Polyolefin
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: PUR, halogen-free/PVC
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 8 x cable diameter

Characteristic impedance
nom. 100 Ω nach IEC 61156-6

Temperature range
Cable with PUR jacket
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C
Cable with PVC jacket
Fixed installation: -40°C to +80°C
Flexing: -10°C bis +70°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
PVC sheath						
2170485	ETHERLINE® FD CAT.6$_A$	4x2xAWG24/7	8.9	1.3	44	88
PUR outer sheath, halogen-free						
2170484	ETHERLINE® FD P CAT.6$_A$	4x2xAWG24/7	8.9	1.3	44	90

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

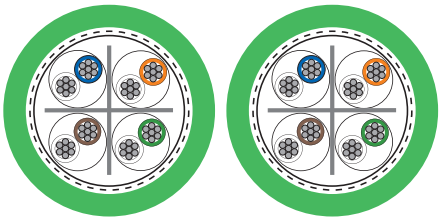
- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177

ETHERLINE® TORSION Cat.6$_A$

Highly flexible application

Info

- Industrial Ethernet Cable, 4-pair, suitable for torsion stress
- CAT.6$_A$ acc. to ISO/IEC 11801
- For PROFINET applications



Benefits

- Many applications with Industrial Ethernet, e.g. PROFINET, i.e. fixed installation, flexible use as well as TORSION.
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet
- Premium screening against electromagnetic interference
- Can be used for Industrial Ethernet in harsh industrial environments

Application range

- Suitable for torsional applications which are typical for the loop in wind turbine generators (WTG)
- Can be used for Industrial Ethernet in harsh industrial environments
- Max. cable lenght für 100 Mbit/s is 85 m
- Max. cable lenght für 100 Mbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- PUR version is halogen-free according to IEC 60754
- Cable suitable for high torsion stress. Tested with more than 1 million bending cycles and a right/left movement of 180° per metre.
- Meets the requirements according to CAT.6$_A$, ISO/IEC 11801 and EN 50173

Norm references / Approvals

- Electrical requirements acc. to IEC 61156-6
- PUR cable is UL/CSA-certified (CMX)
- PUR versions: UL AWM Style 21576
- PVC cable is UL/CSA-certified (CM)
- Flame retardant acc. to IEC 60332-1-2
- Oil-resistant acc. IEC 60811-2-1

Product Make-up

- 7-wire tinned stranded copper conductor
- Core insulation made of polyethylene (PE)
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: PUR, halogen-free/PVC
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 8 x cable diameter

Characteristic impedance
nom. 100 Ω nach IEC 61156-6

Temperature range
Cable with PUR jacket
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C
Cable with PVC jacket
Fixed installation: -40°C to +80°C
Flexing: -10°C bis +70°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
PVC jacket						
2170482	ETHERLINE® TORSION Y CAT6$_A$	4 x 2 x AWG24/7	8.9	1.3	44	88
PUR outer sheath, halogen-free						
2170483	ETHERLINE® TORSION P CAT6$_A$	4 x 2 x AWG24/7	8.9	1.3	44	90

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177

ETHERLINE® TORSION Cat.6$_A$ Patch cables

Info

- Industrial Ethernet Cable, 4-pair, suitable for torsion stress
- Cat.6$_A$ qualified for 10Gbit/s
- Other types are available at www.lappgroup.com/assemblyfinder or on request

Benefits

- Non-permanent connections allow for easy change of equipment
- For directly connecting two electric components

Application range

- Suitable for torsional applications which are typical for the loop in wind turbine generators (WTG)
- Suitable for EtherCAT and EtherNet/IP applications
- Suitable for use in industrial applications
- For indoor use

Product features

- Meets the requirements according to Cat.6$_A$ and class E$_A$
- Suitable for torsion stress

Product Make-up

- Braided conductor, 4x2x AWG24/7
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath made of PUR, 9.4mm in diameter
- Colour: green (based on RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC002599
ETIM 5.0 Class-Description: Patch cord copper (twisted pair) industry

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 8 x outer diameter

Protection rating
IP 67

Temperature range
Flexing: -30°C to +70°C
Fixed installation: -30°C to +80°C

Coding
M12: X-Standard

		M12, plug, straight	M12, socket, straight	Open end
	Length	Article number		
M12, plug, straight	1.0m	2172264	2172278	2172271
	2.0m	2172265	2172279	2172272
	3.0m	2172266	2172280	2172273
	5.0m	2172267	2172281	2172274
	10.0m	2172268	2172282	2172275
M12, socket, straight	1.0m	2172278	2172292	2172285
	2.0m	2172279	2172293	2172286
	3.0m	2172280	2172294	2172287
	5.0m	2172281	2172295	2172288
	10.0m	2172282	2172296	2172289

Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Other lengths are available upon request.

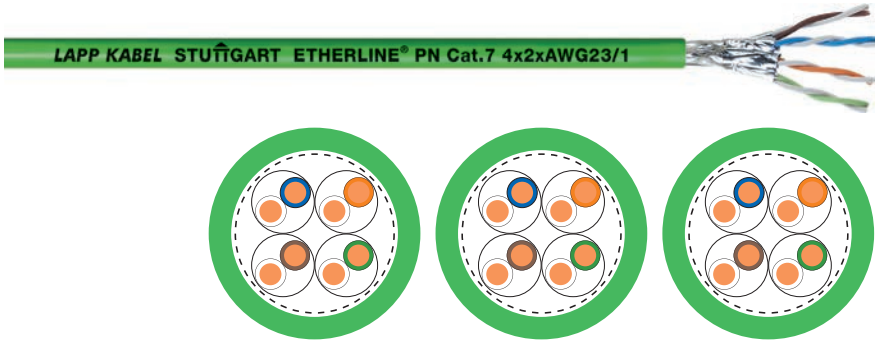
NEW

ETHERLINE® PN Cat.7

Ethernet cable Category 7, Class F for fixed installation - verified up to 600 MHz

Info

- Industrial Ethernet cable
- For PROFINET applications with 4 pairs
- Cat.7 qualified for 10Gbit/s



Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght for 100 Mbit/s up to 10 Gbit/s is 100 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- PUR outer sheath is highly resistant to mineral oils and abrasion
- Robust, halogen-free FRNC outer sheath
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Norm references / Approvals

- Flame retardant acc. to IEC 60332-1-2
- Oil-resistant acc. IEC 60811-2-1
- UL approvals see datasheet

Product Make-up

- Solid bare copper wire AWG23
- Core insulation: foamed polyethylen (PE)
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 8 x outer diameter

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V eff.

Characteristic impedance
100 ± 5 Ω (> 1 MHz)

Temperature range
PVC/FRNC: -30 °C bis +80 °C
PUR: -40 °C bis +80 °C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
PVC outer sheath						
2170605	ETHERLINE® PN CAT.7 Y A	4x2xAWG23/1	8.1	1.4	40	80
Halogen-free jacket						
2170606	ETHERLINE® PN CAT.7 FRNC A	4x2xAWG23/1	8.1	1.4	40	80
PUR outer sheath, halogen-free						
2170607	ETHERLINE® PN CAT.7 P A	4x2xAWG23/1	8.1	1.4	40	80

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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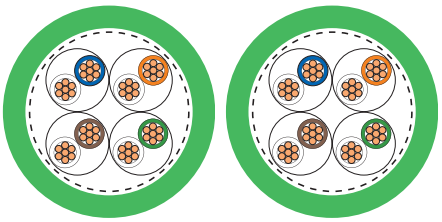
Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177

ETHERLINE® PN Cat.7 FLEX

Ethernet cable Category 7, Class F for flexible application - verified up to 600 MHz



Info

- Industrial Ethernet cable
- For PROFINET applications with 4 pairs
- Cat.7 qualified for 10Gbit/s

Benefits

- Can be used in dry or damp rooms
- Screened against interference
- Can be used for Industrial Ethernet in harsh industrial environments
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable lenght for 100 Mbit/s up to 10 Gbit/s is 100 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- FRNC Version: Halogene free and flame retardant
- The oil-resistant PVC sheath enables usage in industrial environments
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Norm references / Approvals

- Flame retardant acc. to IEC 60332-1-2
- UL approvals see datasheet

Product Make-up

- 7-wire bare stranded copper conductor
- Core insulation: foamed polyethylen (PE)
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 4 x outer diameter
Flexing: 8 x outer diameter

Test voltage
Core/core: 1500 V rms
Core/screen: 1500 V eff.

Characteristic impedance
100 ± 5 Ω (> 1 MHz)

Temperature range
Fixed installation: -30°C to +80°C
Occasional flexing: -5°C to +50°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
PVC Außenmantel						
2170608	ETHERLINE® PN CAT.7 Y FLEX A	4x2xAWG23/7	8.7	1,5	45	81
Halogenfreier Außenmantel						
2170609	ETHERLINE® PN CAT.7 FRNC FLEX A	4x2xAWG23/7	8.7	1,5	45	81

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177

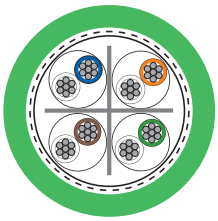
NEW

ETHERLINE® TORSION Cat.7

Highly flexible application

Info

- For Torsion applications (±180°)
- For PROFINET applications with 4 pairs
- Cat.7 qualified for 10Gbit/s



Benefits

- Many applications with Industrial Ethernet, e.g. PROFINET, i.e. fixed installation, flexible use as well as TORSION.
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet
- Premium screening against electromagnetic interference
- Can be used for Industrial Ethernet in harsh industrial environments

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Wiring of machines, tools, devices, appliances and control cabinets
- Max. cable length for 100 Mbit/s is 85 m Max. cable length for 10 Gbit/s is 85 m
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- Cable suitable for high torsion stress. Tested with up to 5 million bending cycles and a right/left movement of 180° per metre.

Norm references / Approvals

- Electrical requirements acc. to IEC 61156-6
- UL/CSA-certified (CMX)
- UL AWM Style 21576
- Flame-retardant according IEC 60332-1-2
- Halogen-free according to IEC 60754-1
- Oil-resistant acc. IEC 60811-2-1

Product Make-up

- 7-wire tinned stranded copper conductor
- Core insulation made of polyethylene (PE)
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath made of PUR
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 8 x outer diameter
Flexing: 15 x outer diameter

Characteristic impedance
100 ± 5 Ω (> 1 MHz)

Temperature range
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C

Article number	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® TORSION Cat.7					
2170481	4x2xAWG24/7	9.4	1.4	44	95

Photographs and graphics are not to scale and do not represent detailed images of the respective products.
UL certifications can be found in the data sheet.

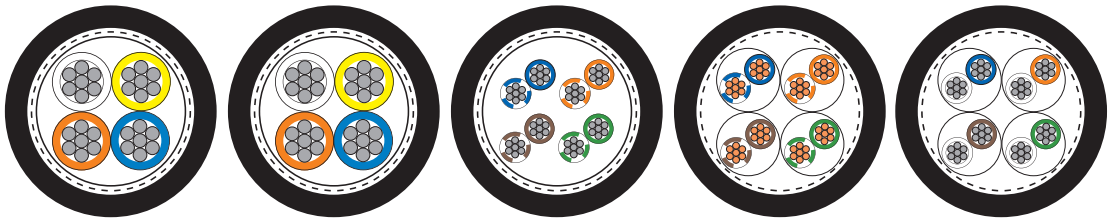
Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177

NEW

ETHERLINE® TRAIN

Ethernet cables according to EN 50264-3-1 Type XM for high requirements in railway applications



Info

- Meets EN 50264-3-2 type XM and EN 45545-2
- Cat.5e Performance up to 100 / 1000 MBit/s
  Cat.6_A & Cat.7 qualified for 10 GBit/s

Benefits

- Good chemical resistance
- Resistant to mechanical influences in harsh environmental conditions
- Extended temperature range
- Reduced flame spreading increases the protection against damage to persons and property in the event of a fire

Application range

- For use in railway vehicles and buses, for fixed installations and applications where limited movement may occur
- Suitable for connecting to of e.g. camera systems, enter-/ infotainment for passengers, ticketing systems
- Also applicable within oily environments and areas with increased ambient temperature

Product features

- Fire behaviour according to EN/IEC:
  - Halogen-free acc. to EN 60754-1
  - No corrosive gases acc. to EN 60754-2
  - No fluorine acc. to EN 60684-2
  - No toxic gases acc. to EN 50305
  - Low smoke density acc. to EN 61034-2
  - Flame-retardant acc. to EN 60332-1-2
  - No fl ame propagation acc. to EN 60332-3-25
- Fire behaviour according to NF:
  - Toxicity of gases acc. to NF X 70-100
  - Low smoke density acc. to NF X 10-702
  - No flame propagation acc. to NF C 32-070, Cat. C1 and C2
- Chemical properties:
  - Oil resistant acc. to EN 50264-1
  - Fuel resistant acc. to EN 50264-1
  - Acid resistant acc. to EN 50264-1
  - Alkali resistant acc. to EN 50264-1
  - Ozone resistant acc. to EN 50264-3-2

Norm references / Approvals

- Electrical requirements acc. to IEC 61156-6
- EN 50264-1
- EN 45545-2 HL1, HL2, HL3

Product Make-up

- 7-wire tinned stranded copper conductor
- Core insulation: Based on Polyolefin
- Cat.5e: SF/UTP - copper braid and foil screening as overall screening
- Cat.6_A/Cat.7: S/FTP - copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: electron beam cross-linked polymer-compound EM 104
- Outer sheath colour: Black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Flexing: 10 x outer diameter
Fixed installation: 8 x outer diameter

Test voltage
Core/core: 1000 V
Core/screen: 1000 V

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6

Temperature range
Fixed installation:
-45°C to +90°C
Occasional flexing: -35°C up to +90°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
Cat.5e, 2-pair version						
2170906	ETHERLINE TRAIN FLEX Cat.5e 1x4x22/7 PE	1x4xAWG22/7	6.5	1,5	30	62
2170910	ETHERLINE TRAIN FLEX Cat.5e 1x4x0,5 PE	1x4x0,5/7	7.6	2,0	41	83
Cat.5e, 4-pair version						
2170907	ETHERLINE TRAIN Cat.5e 4x2x24/7 PE	4x2xAWG24/7	7.7	1,2	38	76
Cat.6_A						
2170908	ETHERLINE TRAIN FLEX Cat.6_A 4x2x24/7 PE	4x2xAWG24/7	8.4	1,4	38	75
Cat.7						
2170909	ETHERLINE TRAIN FLEX Cat.7 4x2x24/7 PE	4x2xAWG24/7	8.4	1,4	43	75

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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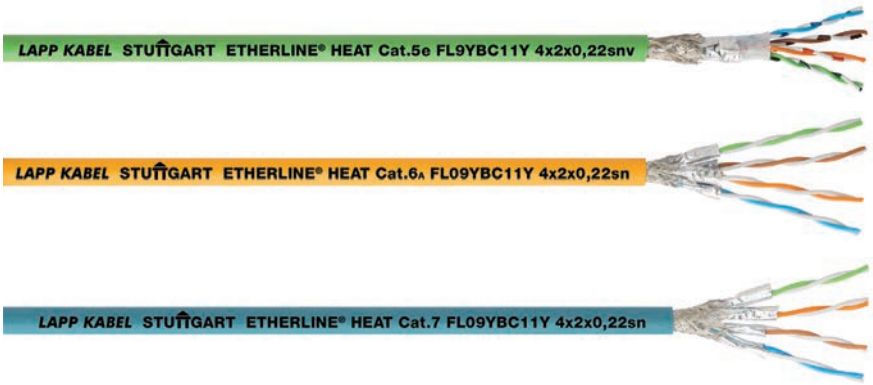
PROFINET EtherNet/IP

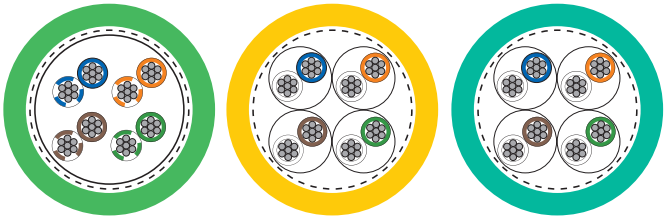
NEW

ETHERLINE® HEAT 6722

Info

- Designed according to ISO 6722
- Tested acc.to ECE-R 118.01
- For PROFINET applications





Benefits

- Easy to strip and dismantle
- Extended temperature range
- Good resistance to oil, petrol, acids and alkalis
- Abrasion and cut-resistant, halogen-free, oil-resistant
- Reduction of flame propagation, density and toxicity of smoke gases in event of fire

Application range

- For flexible applications (7-wire stranded conductor)
- For fixed, flexible and protected installations inside buses
- Suitable for connecting to of e.g. camera systems, enter-/ infotainment for passengers, ticketing systems
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet

Product features

- Good chemical resistance
- Temperature class B on the basis of ISO 6722-1

Norm references / Approvals

- DIN/ISO 6722
- Electrical requirements acc. to IEC 61156-6
- Tested acc.to ECE-R 118.01
- LV 112-1, LV 212-2, LV 213-2
- Halogen-free according to VDE 0472-815
- Flame retardant acc. to ISO 6722-1

Product Make-up

- Stranded tinned 7-wire conductor
- Core insulation: Based on Polyolefin
- Colour-coded in accordance with EIA/TIA 568A and B
- Cat.5e: SF/UTP - copper braid and foil screening as overall screening
- Cat.6$_A$/Cat.7: S/FTP - copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: PUR compound, halogen-free
- Outer sheath colour:
  Cat.5e green (RAL 6018)
  Cat.6$_A$ yellow (RAL 1003)
  Cat.7 blue (RAL 5021)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 10 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6

Temperature range
Flexing: -30 °C to +105 °C
Fixed installation: -40 °C to +105 °C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® HEAT 6722						
2170850	ETHERLINE® Cat. 5e FL9YBC11Y 4x2x0,22sn	4x2xAWG24/7	7.7	1,2	38	72
2170581	ETHERLINE® Cat. 6A FL09YBC11Y 4x2x0,22sn	4x2xAWG24/7	8.1	1,3	38	77
2170582	ETHERLINE® Cat. 7 FL09YBC11Y 4x2x0,22sn	4x2xAWG24/7	8.1	1,3	38	77

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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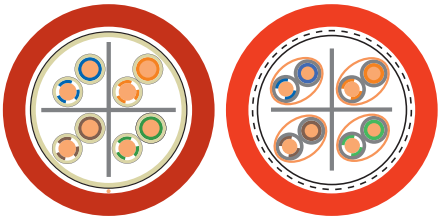
Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12X refer to page 176

ETHERLINE® FIRE

Industrial Ethernet cable with insulation integrity



Info

- Insulation integrity for at least 120 minutes in the event of fire

Benefits

- Ensures that the cable can still transmit data during and after a fire for 120 min (according to EN50200)
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference

Application range

- In industrial areas that use fire as a tool
- Highly combustible or fire-prone areas
- For fixed installation
- For indoor use

Product features

- Fire behaviour:
  - Halogen-free (IEC 60754-1 & EN50267-2-1)
  - Flame-retardant (IEC 60332-1)
  - Fire retardant (IEC 60332-3-24)
  - Low smoke density (IEC 61034-2)
  - Circuit integrity (EN50200); 120 min

Product Make-up

- Solid bare copper conductor
- Core insulation: Based on Polyolefin
- Each insulation will be wrapped with a special tape (anti-fire barrier)
- Twisting: 2 twisted-pair cores, stranding from 4 pairs
- Halogen-free and flame-retardant FRNC outer sheath, colour: red (similar to RAL3000)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Peak operating voltage
(not for power applications) 125 V

Minimum bending radius
Fixed installation: 15 x outer diameter

Characteristic impedance
nom. 100 Ω nach IEC 61156-5

Temperature range
Operation: -20 °C to +70 °C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® FIRE						
2170905	ETHERLINE® FIRE Cat.5e PH120	4 x 2 x AWG23/1	8.6	1,0	24	75
2170913	ETHERLINE FIRE Cat.6 PH120	4 x 2 x AWG22/1	10.2	1.5	24	145

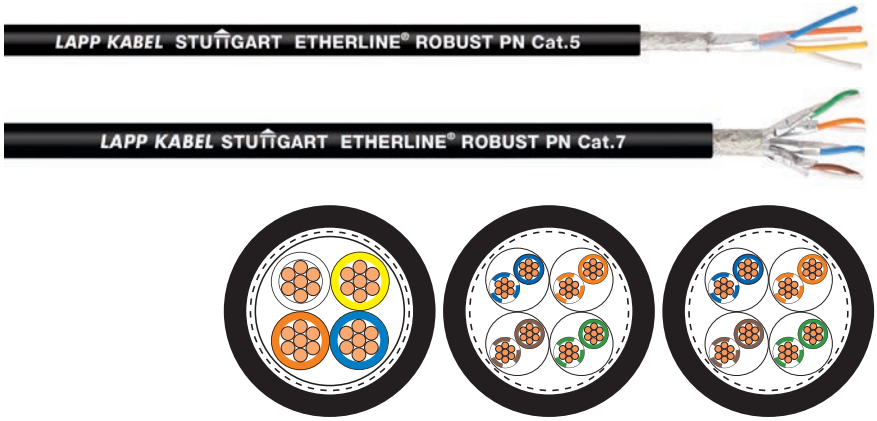
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

ETHERLINE® ROBUST

Flexible use

Info

- For PROFINET applications
- Good chemical resistance



Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with plant, animal or synthetic-based organic substances, oils, greases, waxes and the related emulsions
- Good resistance to ammonia compounds and bio-gases
- Good resistance to cold and hot water as well as water-soluble cleaning and cooling agents
- Well-suited to steam cleaning

Application range

- For flexible applications (7-wire stranded conductor)
- Machine tool building, medical technology, laundries, car washing equipment, chemical industry, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702

Product features

- Halogen-free materials
- Good chemical resistance to ester-based hydraulic fluids
- UV-resistant acc. to ISO 4892-2
- Ozone-resistant acc to. EN 50396
- Low smoke density according to IEC 61034-2

Product Make-up

- 7-wire bare stranded copper conductor
- Core insulation: Based on Polyolefin
- Screening: wrapped with braided tinned-copper wires
- Outer sheath made of special TPE
- Colour: black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
Flexing: 10 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6

Temperature range
Occasional flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
PROFINET Cat.5e						
2170451	ETHERLINE® ROBUST PN Cat.5	2x2xAWG22/7	6.5	1.5	30.4	50
PROFINET Cat.7						
2170452	ETHERLINE® ROBUST PN Cat.7	4x2xAWG23/7	8.7	1.5	48	75
Industrial Ethernet Cat.7						
2170453	ETHERLINE® ROBUST Cat.7 FLEX	4x2xAWG26/7	6.2	1	27	36

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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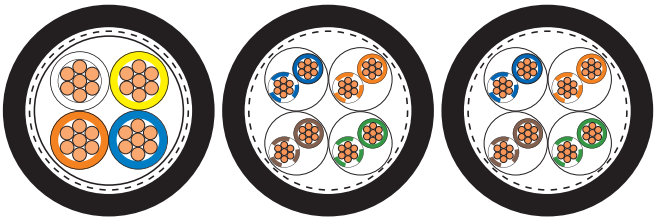
Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12D refer to page 176
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177

ETHERLINE® ROBUST FR



Info

- For PROFINET applications
- Flame-retardant

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Good resistance to cold and hot water as well as water-soluble cleaning and cooling agents
- Well-suited to steam cleaning

Application range

- For flexible applications (7-wire stranded conductor)
- Machine tool building, medical technology, laundries, car washing equipment, chemical industry, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- Suitable for EtherCAT and EtherNet/IP applications

Product features

- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- Flame retardance makes it suitable for indoor and outdoor installations
- 2pair: 10/100 Mbit/s for Industrial Ethernet
- 4pair: 100Mbit/s up to 10 Gbit/s for Industrial Ethernet
- Many applications with Industrial Ethernet, e.g. PROFINET type B, i.e. fixed installation and flexible use.

Norm references / Approvals

- UV-resistant according to ISO 4892-2
- Ozone-resistant according to EN 50396
- Flame-retardant according IEC 60332-1-2

Product Make-up

- 7-wire bare stranded copper conductor
- Core insulation: Based on Polyolefin
- Screening: wrapped with braided tinned-copper wires
- Outer sheath made of special TPE
- Colour: black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
Flexing: 10 x outer diameter
Fixed installation: 4 x Outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-6

Temperature range
Occasional flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Core diameter in mm	Copper index (kg/km)	Weight (kg/km)
PROFINET Cat.5e						
2170454	ETHERLINE® ROBUST PN FR Cat.5	2x2xAWG22/7	6.5	1.5	30.4	55
PROFINET Cat.7						
2170455	ETHERLINE® ROBUST PN FR Cat.7	4x2xAWG23/7	8.7	1.5	48	80
Industrial Ethernet Cat.7						
2170456	ETHERLINE® ROBUST FR Cat.7 FLEX	4x2xAWG26/7	6.2	1	27	40

Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA M12D refer to page 176
- EPIC® DATA M12X refer to page 176
- EPIC® DATA CCR FA refer to page 177

NEW

ETHERLINE® ACCESS M05T/M08T

Managed switches for industrial communication

Info

- Redundant power inputs
- Robust metal housing and DIN rail mounting
- Fanless maintenance free

Benefits

- Improve your total cost of ownership with faster installation and lower downtime
- Most flexible and globally present solutions from one hand

Product features

- Simple setup of redundant networktopologies with reconfiguration time < 20 ms
- RJ45 Ports: 10/100BaseT(X)
- Packet Buffer Size: 1 Mbit
- Supported protocols: HTTP, Telnet,EtherNet/IP, Modbus/TCP, IPv6, and many more
- Redundant Power Input: 24 VDC

Norm references / Approvals

- Shock IEC 60068-2-27
- Freefall IEC60068-2-32
- Vibration IEC 60068-2-6

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000734
ETIM 5.0/6.0 Class-Description: Network switch

Protection rating
IP 30

Temperature range
0°C to +60°C

Article number	Article designation	Ports RJ45	Ports RJ45	MTBF in years
ETHERLINE® ACCESS M05T/M08T				
21700121	ETHERLINE® ACCESS M05T	Managed	5	> 97
21700122	ETHERLINE® ACCESS M08T	Managed	8	> 125

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- ETHERLINE® EC FD Cat.5e RJ45 refer to page 138

ETHERLINE® ACCESS U05T/U08T

Unmanaged switches for industrial communication

Info

- Redundant power inputs
- Robust metal housing and DIN rail mounting
- Fanless maintenance free

Benefits

- Improve your total cost of ownership with faster installation and lower downtime
- Most flexible and globally present solutions from one hand

Product features

- RJ45 Ports: 10/100BaseT(X)
- Packet Buffer Size: 512 kbit
- Broadcast storm protection
- Redundant Power Input: 24 VDC

Norm references / Approvals

- Shock IEC 60068-2-27
- Freefall IEC60068-2-32
- Vibration IEC 60068-2-6

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000734
ETIM 5.0/6.0 Class-Description: Network switch

Protection rating
IP 30

Temperature range
-10°C to +60°C

Article number	Article designation	Ports RJ45	Ports RJ45	MTBF in years
ETHERLINE® ACCESS U05T/U08T				
21700118	ETHERLINE® ACCESS U05T	Unmanaged	5	> 347
21700119	ETHERLINE® ACCESS U08T	Unmanaged	8	> 277

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

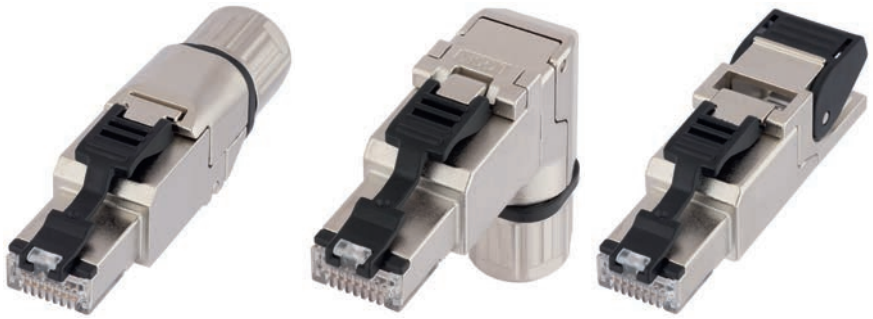
Accessories

- ETHERLINE® EC FD Cat.5e RJ45 refer to page 138

EPIC® DATA RJ45

Info

- CAT.6$_A$ acc. to ISO/IEC 11801
- Colour-coded assembly aid
- Installation without tools



Product features

- Field assembly Industrial Ethernet RJ45 connector
- Suitable for 10BASE-T / 100BASE-T / 1000BASE-T / 10GBASE-T
- Housing: zinc die-casting, grey
- 4 different angled cable outlets possible
- Suitable for use in industrial applications

Norm references / Approvals

- ISO/IEC 11801, Cat.5e
- ISO/IEC 60603-7-51, RJ45 up to 500 MHz
- UL-listed (E-File E353543)

Technical data

Protection rating
IP 20

Ambient temperature (operation)
-40°C to +85°C

Article number	Design	Min. outer diameter (mm)	Max. outer diameter (mm)	Min. Core diameter in mm	Max. Core diameter in mm	PU	AWG solid	AWG 7-wire	AWG 19-wire
PROFINET colour-coding (2-pairs)									
21700605	Straight, latched	5	9	1	1.6	10	24 - 22	27 - 22	22*
21700651	Straight, cable gland	5.5	10	1	1.6	1	24 - 22	27 - 22	22*
21700638	Angled, cable gland	5.5	10	1	1.6	1	24 - 22	27 - 22	22*
colour-coded acc. to EIA/TIA 568A									
21700600	Straight, latched	5	9	1	1.6	10	24 - 22	27 - 22	
21700652	Straight, cable gland	5.5	10	1	1.6	1	24 - 22	27 - 22	
21700636	Angled, cable gland	5.5	10	1	1.6	1	24 - 22	27 - 22	
colour-coded acc. to EIA/TIA 568B									
21700601	Straight, latched	5	9	1	1.6	10	24 - 22	27 - 22	
21700653	Straight, cable gland	5.5	10	1	1.6	1	24 - 22	27 - 22	
21700637	Angled, cable gland	5.5	10	1	1.6	1	24 - 22	27 - 22	
colour-coded acc. to EIA/TIA 568A for small wire diameters									
21700615	Straight, latched	5	9	0.85	1.1	10	26 - 24	27 - 24	26*
21700654	Straight, cable gland	5.5	10	0.85	1.1	1	26 - 24	27 - 24	26*
21700639	Angled, cable gland	5.5	10	0.85	1.1	1	26 - 24	27 - 24	26*
colour-coded acc. to EIA/TIA 568B for small wire diameters									
21700616	Straight, latched	5	9	0.85	1.1	10	26 - 24	27 - 24	26*
21700655	Straight, cable gland	5.5	10	0.85	1.1	1	26 - 24	27 - 24	26*
21700640	Angled, cable gland	5.5	10	0.85	1.1	1	26 - 24	27 - 24	26*

Photographs and graphics are not to scale and do not represent detailed images of the respective products.
An approval is necessary for 19-wire cables by Lapp Group
Approved cables: 2170289 & 2170489 ETHERLINE® Cat.5e FD; CE217489 ETHERLINE® Cat.5 FD BK; 2170488 ETHERLINE® Cat.6 FD

EPIC® DATA AX RJ45 Cat.6$_A$ IP68

RJ45 connector in IP68 housing

Info

- CAT.6$_A$ acc. to ISO/IEC 11801
- Installation without tools

Product features

- Housing: brass nickel plated
- Qualified for 10 Gigabit/s Ethernet
- Suitable for stranded cores with AWG27/7 -22/7 and for solid conductors with AWG26/1- 22/1

Norm references / Approvals

- Field assembly Industrial Ethernet connector, RJ45 according to IEC 60603-7-51
- UL-listed (E-File E353543)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002062
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector

Protection rating
IP 68

Ambient temperature (operation)
-40°C to +85°C
circular housing: -40°C to +85°C

Article number	Article designation	PU
Protective housing (male) containing RJ45 connector (article 21700601)		
21700630	ED-IE-AX-RJ45-6A-B-68-FC	1
dust cap for Protective housing (male)		
21700631	ED-IE-AX-RJ45-AC-DC	10
Protective housing (female) containing RJ45 socket (article 21700612)		
21700632	ED-IE-RJ45F-6A-B-68-FC	1
dust cap for Protective housing (female)		
21700633	ED-IE-RJ45F-AC-DC	10

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA HS RJ45F Cat.6$_A$

DIN-rail adapter with RJ45 socket

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001121
ETIM 5.0/6.0 Class-Description: Modular connector

Protection rating
IP 20

Ambient temperature (operation)
-40°C to +70°C

Product features

- Plastic housing including Easy Connect RJ45 Modul Cat.6$_A$ 10G
- Suitable for use in industrial applications
- Colour: light grey (RAL 7035)
- Suitable for stranded cores with AWG27/7 -22/7 and for solid conductors with AWG26/1- 22/1

Norm references / Approvals

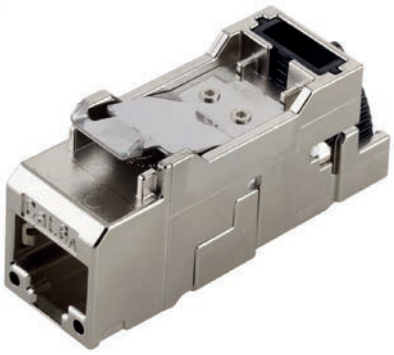
- Field assembly Industrial Ethernet module RJ45 according to IEC 60603-7-51

Article number	Article designation	PU
DIN-rail adapter containing RJ45 socket acc. to T568A (article 21700611)		
21700613	EPIC DATA HS RJ45 F 10G A	1
DIN-rail adapter containing RJ45 socket acc. to T568B(article 21700612)		
21700614	EPIC DATA HS RJ45 F 10G B	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA RJ45F Cat.6$_A$

RJ45 socket



Info

- CAT.6$_A$ acc. to ISO/IEC 11801
- Installation without tools

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001121
ETIM 5.0/6.0 Class-Description: Modular connector

Protection rating
IP 20

Ambient temperature (operation)
-40°C to +70°C

Product features

- Field assembly Industrial Ethernet module RJ45 according to IEC 60603-7-51
- Qualified for 10 Gigabit/s Ethernet
- Housing: zinc die-casting, grey
- Suitable for stranded cores with AWG27/7 -22/7 and for solid conductors with AWG26/1- 22/1
- Suitable for use in industrial applications
- Available with colour code T568A or T568B

Norm references / Approvals

- Field assembly Industrial Ethernet connector, RJ45 according to IEC 60603-7-51
- UL-listed (E-File E353543)

Article number	Article designation	Min. outer diameter (mm)	Max. outer diameter (mm)	Min. Core diameter in mm	Max. Core diameter in mm	PU
RJ45 socket acc. to T568A						
21700611	ED-IE-AX-RJ45F-6A-A-FC	5,0	9,0	0,9	1,6	24
RJ45 socket acc. to T568B						
21700612	ED-IE-AX-RJ45F-6A-B-FC	5,0	9,0	0,9	1,6	24

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA M12D

Info

- CAT.5-Performance
- Installation without tools

Product features

- Field assembly Industrial Ethernet connector, M12 D-coded according to IEC 61076-2-101
- Suitable for use in industrial applications
- Robust and vibrations- resistant
- Toolfree installation, small and compact design

Norm references / Approvals

- Data transmission is conform to category Cat.5 acc. to ISO 11801

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001121
ETIM 5.0/6.0 Class-Description: Modular connector

Protection rating
IP 67

Ambient temperature (operation)
-25°C to +85°C

Article number	Article designation	Min. outer diameter (mm)	Max. outer diameter (mm)	PU	AWG solid	AWG 7-wire
M12 D-coded plug, straight, colour coding acc. to PROFINET						
21700647	ED-IE-AX-M12D-5-PN-67-FC	6.2	9.7	1	26-22	26-22
M12 D-coded plug, straight, colour coding acc. to TIA 568						
21700648	ED-IE-AX-M12D-5-67	5	6.1	1	26-22	26-22
M12 D-coded socket, straight, TIA 568 colour coding						
22261016	AB-C4-M12FSD-SH	4	8	1	26-22	26-22

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA M12X

Info

- CAT.6$_A$ acc. to ISO/IEC 11801
- Installation without tools

Product features

- Field assembly Industrial Ethernet connector, M12 X-coded according to IEC 61076-2-109
- Qualified for 10 Gigabit/s Ethernet
- Suitable for use in industrial applications
- Robust and vibrations- resistant
- Housing: zinc die-casting, grey
- Insulation displacement contacts for conductor diameter of AWG27/7 - AWG22/7 and AWG24/1 - AWG22/1; max. outer diameter 9,7 mm
- Toolfree installation, small and compact design

Norm references / Approvals

- Acc. to standard IEC 61076-2-109
- Data transmission is conform to category Cat.6Aacc. to ISO/IEC 11801:2010

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001121
ETIM 5.0/6.0 Class-Description: Modular connector

Protection rating
IP 67

Ambient temperature (operation)
Plug/socket -40°C to +85°C

Article number	Article designation	Min. outer diameter (mm)	Max. outer diameter (mm)	Min. Core diameter in mm	Core diameter in mm	PU	AWG solid	AWG 7-wire
M12 X-coded plug, straight								
21700602	ED-IE-AX-M12X-6A-67-FC	6.3	9.7	0.85	1.6	1	26-22	26-22
M12 X-coded socket, straight								
21700621	ED-IE-AX-M12XF-6$_A$-67-FC	6.3	9.7	0.85	1.6	1	26-22	26-22
M12 X-coded socket, straight for wall mounting								
21700622	ED-IE-AX-M12XF-RM-6$_A$-67-FC	6.3	9.7	0.85	1.6	1	26-22	26-22

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA FT IE

Industrial Ethernet feed through

Product features

- Designs for front and rear wall-mounting
- M12 panel feed-throughs for direct connecting with PCB
- Can be used for Industrial Ethernet in harsh industrial environments
- Housing: zinc die-casting, grey

Norm references / Approvals

- Acc. to standard IEC 61076-2
- D-coded: Cat.5 acc. to ISO 11801
  X-coded: Cat.6_A acc. to ISO 11801

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002061
ETIM 5.0/6.0 Class-Description: Sensor-actuator connector chassis

Protection rating
IP 67

Ambient temperature (operation)
-25°C to +85°C

Article number	Article designation
M12 feed through, socket on socket, D-coded	
22262022	AB-C4-DSI-M12FSD-M12FSD-M16-SH
M12 flush-type connector socket for front-mounting, X-coded	
21700617	ED-IE-M12F-X-FM
M12 flush-type connector socket for rear wall mounting, solder contacts for circuit board, X-coded	
21700618	ED-IE-M12F-X-RM

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

EPIC® DATA CCR FA

Cable coupler round

Info

- Installation without tools
- For easy extension in the field

Product features

- Field mountable cable coupler for data cables up to Cat.7A
- Compact, round design
- Qualified for 10 Gigabit/s Ethernet
- Suitable for use in industrial applications
- Robust and vibrations- resistant
- Housing: zinc die-casting, grey

Norm references / Approvals

- Compliance to class FA up to 1000 MHz in connection with Cat.7A cables
- Data transmission is conform to category Cat.7A acc. to ISO/IEC 11801

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001121
ETIM 5.0/6.0 Class-Description: Modular connector

Protection rating
IP 67

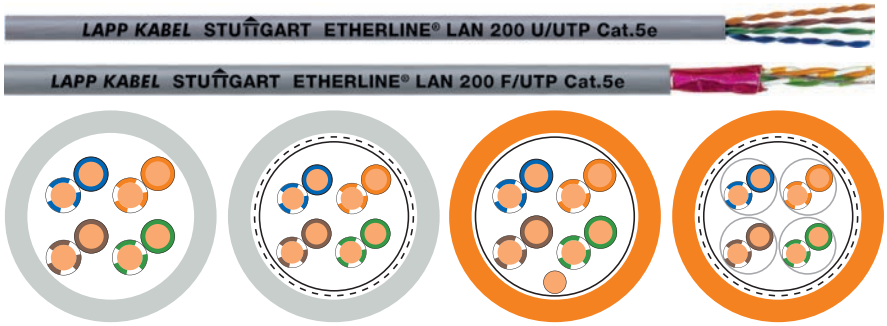
Ambient temperature (operation)
Plug/socket -40°C to +85°C

Article number	Article designation	Min. outer diameter (mm)	Max. outer diameter (mm)	Min. Core diameter in mm	Max. Core diameter in mm	AWG solid	AWG 7-wire
EPIC® DATA CCR FA							
21700623	EPIC® DATA CCR FA	5	9.7	0,85	1,6	26 - 22	26 - 22

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

ETHERLINE® LAN 200 Cat.5e

Ethernet cable for Category 5e/ class D - verfied up to 200 MHz



Info

- CPR: Article number choice under www.lappkabel.com/cpr

Benefits

- LAN cables for structured building cabling according to EN 50173 and ISO/IEC 11801

Application range

- Areas where the end device density is very high
- For office wiring, administration and development buildings in the tertiary sector (floor wiring).
- Cable length in tertiary area (horizontal area, floor) should not exceed a length of 100 m in accordance with the ISO/IEC 11801 and EN 50173 standards (90 m in cable duct + 10 m in working area)

Product features

- Transfer of digital and analogue data signals
- IEEE 802.3: 10/100/1000Base-T
- Flame retardant acc. to IEC 60332-1-2

Norm references / Approvals

- LAN CAT.5e cables from Lapp Kabel for „Structured Cabling Systems“ meet the requirements in accordance with EIA/TIA-568 and TSB36, as well as ISO/IEC 11801 or EN 50173 (Class D).

Product Make-up

- Solid conductor 4x2xAWG24/1
- U/UTP: no overall or pair screening
- F/UTP: foil screening as overall screening
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- Outer sheath either as PVC (grey RAL 7035) or LSZH (orange RAL 2003)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
during installation: 8 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 Ω nach IEC 61156-5

Temperature range
Fixed installation: -20°C to +60°C
During installation: 0 °C to +50 °C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Colour	Copper index (kg/km)	Weight (kg/km)
PVC							
2170950	200 U/UTP Cat.5e	4 x 2 x AWG24/1	0.9	5.1	grey	17	32
2170951	200 SF/UTP Cat.5e	4 x 2 x AWG24/1	1.05	6.3	grey	28	46
LSZH							
2170952	200 F/UTP Cat.5e LSZH	4 x 2 x AWG24/1	1.05	6.3	orange	18	40
2170953	200 SF/UTP Cat.5e LSZH	4 x 2 x AWG24/1	1.05	6.4	orange	28	46

Copper price basis: EUR 100/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Drum
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

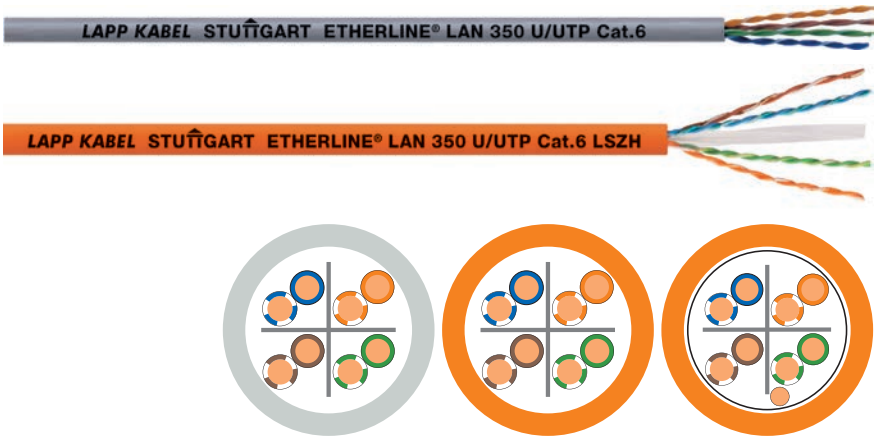
- Field-Terminable Connector RJ45 CAT.5e FM45 refer to main catalogue 2018/19

ETHERLINE® LAN 350 Cat.6

Ethernet cable for Category 6/ class E - verified up to 350 MHz

Info

- CPR: Article number choice under www.lappkabel.com/cpr



Benefits

- LAN cables for structured building cabling according to EN 50173 and ISO/IEC 11801

Application range

- Areas where the end device density is very high
- For office wiring, administration and development buildings in the tertiary sector (floor wiring).
- Cable length in tertiary area (horizontal area, floor) should not exceed a length of 100 m in accordance with the ISO/IEC 11801 and EN 50173 standards (90 m in cable duct + 10 m in working area)

Product features

- Transfer of digital and analogue data signals
- IEEE 802.3: 10/100/1000Base-T IEEE 802.5: ISDN; FDDI; ATM
- Flame retardant acc. to IEC 60332-1-2

Norm references / Approvals

- LAN CAT.6 cables from Lapp Kabel for „Structured Cabling Systems“ meet the requirements in accordance with EIA/TIA-568 and TSB36, as well as ISO/IEC 11801 or EN 50173 (Class E - permanent link).
- Class E out of the standard ISO/IEC 11801 corresponds to CAT.6

Product Make-up

- Solid conductor
- U/UTP: no overall or pair screening, 2 cores stranded to pair, 4 pairs stranded to bundle with central cross
- F/UTP: Foil shielding as overall shielding, 2 cores stranded to pair, 4 pairs stranded to bundle with central cross
- Outer sheath either as PVC (grey RAL 7035) or LSZH (orange RAL 2003)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
during installation: 8 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Fixed installation: -20°C to +60°C
During installation: 0 °C to +50 °C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Colour	Copper index (kg/km)	Weight (kg/km)
PVC							
2170954	350 U/UTP Cat.6	4 x 2 x AWG24/1	0.95	6.0	grey	18	40
LSZH							
2170955	350 U/UTP Cat.6 LSZH	4 x 2 x AWG24/1	0.95	6.0	orange	18	40
2170956	350 F/UTP Cat. 6 LSZH	4 x 2 x AWG23/1	1.07	7.4	orange	19	52

Copper price basis: EUR 100/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Drum
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

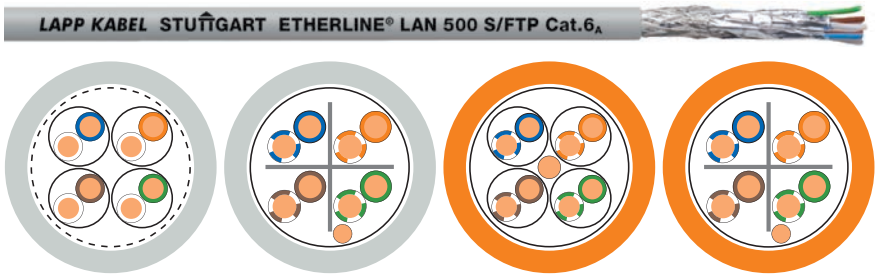
Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA 90 RJ45 Cat.6$_A$ refer to main catalogue 2018/19

NEW

ETHERLINE® LAN 500 Cat.6$_A$

Ethernet cable for Category 6$_A$/ class E$_A$ -verified up to 500 MHz



Info

- CPR: Article number choice under www.lappkabel.com/cpr

Benefits

- LAN cables for structured building cabling according to EN 50173 and ISO/IEC 11801

Application range

- Areas where the end device density is very high
- For office wiring, administration and development buildings in the tertiary sector (floor wiring).
- Cable length in tertiary area (horizontal area, floor) should not exceed a length of 100 m in accordance with the ISO/IEC 11801 and EN 50173 standards (90 m in cable duct + 10 m in working area)

Product features

- Transfer of digital and analogue data signals
- IEEE 802.3: 10/100/1000Base-T, 10GBase-T IEEE 802.5: ISDN; FDDI; ATM; cable sharing
- Flame retardant acc. to IEC 60332-1-2

Norm references / Approvals

- LAN Cat.6$_A$ cables from Lapp Kabel for „Structured Cabling Systems“ meet the requirements in accordance with EIA/TIA-568 and TSB36, as well as ISO/IEC 11801 or EN 50173 (Class E$_A$ - permanent link).

Product Make-up

- Solid conductor 4x2xAWG23/1
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- F/UTP: Foil shielding as overall shielding, 2 cores stranded to pair, 4 pairs stranded to bundle with central cross
- F/FTP: aluminium compound foil as overall screening and pair screening
- Outer sheath either as PVC (grey RAL 7035) or LSZH (orange RAL 2003)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
during installation: 8 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Fixed installation: -20°C to +60°C
During installation: 0 °C to +50 °C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Colour	Copper index (kg/km)	Weight (kg/km)
PVC							
2170960	500 S/FTP Cat.6$_A$	4 x 2 x AWG23/1	1.28	7.3	grey	24	52
2170961	500 F/UTP Cat.6$_A$	4 x 2 x AWG23/1	1.09	7.4	grey	24	52
LSZH							
2170962	500 F/FTP Cat.6$_A$ LSZH	4 x 2 x AWG23/1	1.28	7.3	orange	22	54
2170963	500 F/UTP Cat.6$_A$ LSZH	4 x 2 x AWG23/1	1.09	7.4	orange	24	56

Copper price basis: EUR 100/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Drum
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA 90 RJ45 Cat.6$_A$ refer to main catalogue 2018/19

NEW

ETHERLINE® LAN 1000 Cat. 7_A

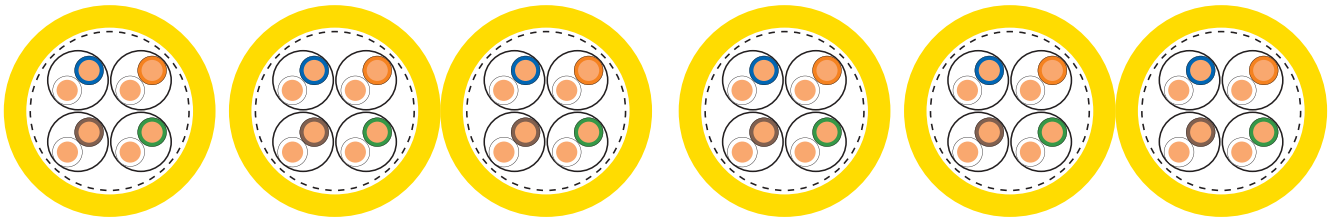
Ethernet cable for Category 7_A / class F_A - verified up to 1000 MHz

Info

- CPR: Article number choice under www.lappkabel.com/cpr

ETHERLINE® LAN 1200 Cat.7_A

Ethernet cable for Category 7_A / class F_A - verified up to 1200 MHz



Benefits

- LAN cables for structured building cabling according to EN 50173 and ISO/IEC 11801

Application range

- Areas where the end device density is very high
- For office wiring, administration and development buildings in the tertiary sector (floor wiring).
- Cable length in tertiary area (horizontal area, floor) should not exceed a length of 100 m in accordance with the ISO/IEC 11801 and EN 50173 standards (90 m in cable duct + 10 m in working area)

Product features

- Transfer of digital and analogue data signals
- IEEE 802.3: 10/100/1000Base-T, 10GBase-T IEEE 802.5: ISDN; FDDI; ATM; cable sharing IEEE 802.3at: suitable for PoE, VoIP

Norm references / Approvals

- LAN Cat.7A cables from Lapp Kabel for „Structured Cabling Systems“ meet the requirements in accordance with EIA/TIA-568 and TSB36 as well as ISO/IEC 11801 or EN 50173 (Class FA - permanent link).
- Flame-retardant according IEC 60332-1-2
- No flame-propagation according to IEC 60332-3-25 (Flame spread on vertical cable or wire bundle)

Product Make-up

- Solid conductor 4x2xAWG23/1, duplex 2x(4x2xAWG23/1)
- Core insulation: PE
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: halogen-free, flame-retardant compound
- Colour: yellow (RAL 1021)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
during installation: 8 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
ETHERLINE® LAN 1000 Cat. 7_A

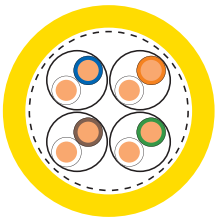
Temperature range
Fixed installation: -20°C to +60°C
During installation: 0 °C to +50 °C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Colour	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® LAN 1000 S/FTP Cat.7_A							
2170971	1000 S/FTP Cat.7_A LSZH	4 x 2 x AWG23/1	1.3	7.5	yellow	24	56
2170972	1000 S/FTP Cat.7_A LSZH duplex	2x (4x2xAWG23/1)	1.3	15.2	yellow	48	113
ETHERLINE® LAN 1200 S/FTP Cat.7_A							
2170974	1200 S/FTP Cat.7_A LSZH	4 x 2 x AWG23/1	1.33	7.5	yellow	26	58
2170975	1200 S/FTP Cat.7_A LSZH duplex	2x (4x2xAWG23/1)	1.33	15.2	yellow	52	114

Copper price basis: EUR 100/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Drum
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

ETHERLINE® LAN 1600 Cat.7$_A$

Data cable for Category 7$_A$/ class F$_A$ - verified up to 1600 MHz



Info

- CPR: Article number choice under www.lappkabel.com/cpr
- Verified up to 1600 MHz at max. 30m cable length (data centers)

Benefits

- LAN cables for structured building cabling according to EN 50173 and ISO/IEC 11801

Application range

- Mainly used where the terminal density is very high, e.g. for wiring office, administration and development buildings in the tertiary area (floor wiring).
- 1500 MHz: Cable length in tertiary area (horizontal area, floor) should not exceed a length of 100 m in accordance with the ISO/IEC 11801 and EN 50173 standards (90 m in cable duct + 10 m in working area)
- 1600 MHz: at max. 30m length (typical in data centers)

Product features

- Transfer of digital and analogue data signals
- IEEE 802.3: 10/100/1000Base-T, 10GBase-T IEEE 802.5: ISDN; FDDI; ATM; cable sharing IEEE 802.3at: suitable for PoE, VoIP

Norm references / Approvals

- LAN Cat.7A cables from Lapp Kabel for „Structured Cabling Systems“ meet the requirements in accordance with EIA/TIA-568 and TSB36 as well as ISO/IEC 11801 or EN 50173 (Class FA - permanent link).
- Exceeds the requirements of EN 50173 and ISO/IEC 11801 standards
- Flame-retardant according IEC 60332-1-2
- No flame-propagation according to IEC 60332-3-25 (Flame spread on vertical cable or wire bundle)

Product Make-up

- Solid conductor 4x2xAWG22/1
- Core insulation: cellular polyolefin
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: halogen-free, flame-retardant compound
- Colour: yellow (RAL 1021)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
during installation: 8 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 Ω nach IEC 61156-5

Temperature range
Fixed installation: -20°C to +60°C
During installation: 0 °C to +50 °C

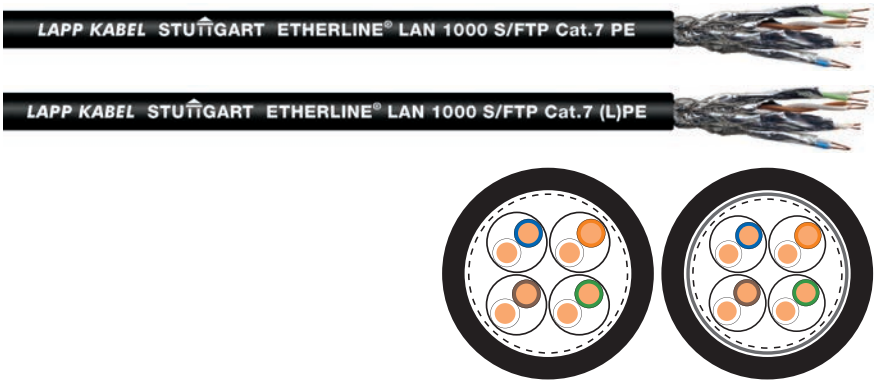
Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Colour	Copper index (kg/km)	Weight (kg/km)
ETHERLINE® LAN 1600 Cat.7$_A$							
2170976	1600 S/FTP Cat.7$_A$ LSZH	4 x 2 x AWG22/1	1.56	8.2	yellow	34	71

Copper price basis: EUR 100/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Drum
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

NEW

ETHERLINE® LAN 1000 Cat.7 OUTDOOR

Ethernet cable for Category 7/ class F - verified up to 1000 MHz, for outdoor applications and direct burial



Benefits

- LAN cables for structured building cabling according to EN 50173 and ISO/IEC 11801
- Suitable for outdoor use and direct burial
- UV-resistant

Application range

- For outdoor use
- Suitable for direct burial
- Cable length in tertiary area (horizontal area, floor) should not exceed a length of 100 m in accordance with the ISO/IEC 11801 and EN 50173 standards (90 m in cable duct + 10 m in working area)

Product features

- Transfer of digital and analogue data signals
- IEEE 802.3: 10/100/1000Base-T, 10GBase-T IEEE 802.5: ISDN; FDDI; ATM; cable sharing
- Backward compatible

Norm references / Approvals

- LAN Cat.7 cables from Lapp Kabel for „Structured Cabling Systems“ meet the requirements in accordance with EIA/TIA-568 and TSB36, as well as ISO/IEC 11801 or EN 50173 (Class F - permanent link).

Product Make-up

- Solid conductor 4x2xAWG23/1
- Core insulation: PE
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath: PE, black
  (L)PE additional with aluminum tape
- Farbe: schwarz (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
during installation: 8 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 Ω acc. to IEC 61156-5

Temperature range
Bei VerlegungFlexing: -10°C to +50°C
During laying: -30°C to +70°C

Article number	Article designation	Number of pairs and AWG per conductor	Core diameter in mm	Outer diameter [mm]	Colour	Copper index (kg/km)	Weight (kg/km)
Suitable for direct burial							
2170978	1000 S/FTP Cat.7 PE	4 x 2 x AWG23/1	1.3	7.7	black	24	48
Suitable for direct routing underground, transversely waterproof							
2170977	1000 S/FTP Cat.7 (L)PE	4 x 2 x AWG23/1	1.3	9.6	black	24	77

Copper price basis: EUR 100/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Drum
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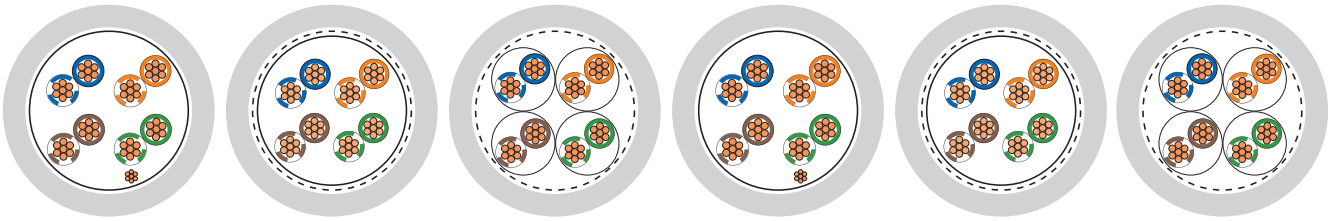
UNITRONIC® LAN FLEX

Data cable for patchcable applications

Info

- Only for patch cable applications (max. 60 m)



Benefits

- For directly connecting two electric components
- Easy to assemble

Application range

- Indoor applications
- LAN connections
- Control cabinet wiring

Product features

- Good flexibility - easy installation with tight space requirements
- Flame retardant acc. to IEC 60332-1-2 2170139: flame retardant acc. to IEC 60332-1-2 and IEC 60332-3-24

Product Make-up

- F/UTP: foil screening as overall screening
- SF/UTP: braid of tinned copper wire and plastic laminated aluminum foil as overall screening
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath either as PVC or LSZH (color grey RAL 7035)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

Minimum bending radius
during installation: 8 x outer diameter
Fixed installation: 4 x outer diameter

Mean characteristic Impedance
nom. 100 Ω nach IEC 61156-5

Temperature range
Operating temperature: -20°C to +60°C
During installation: 0 °C to +50 °C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PVC versions					
2170127	200 F/UTP CAT.5e FLEX	4 x 2 x AWG26/7	5.6	13	28
2170129	200 SF/UTP CAT.5e FLEX	4 x 2 x AWG26/7	6.0	22	36
2170144	600 S/FTP CAT.7 Y FLEX	4 x 2 x AWG26/7	6.5	22	39
Halogen-free versions					
2170172	200 F/UTP CAT.5e LSZH FLEX	4 x 2 x AWG26/7	5.6	13	28
2170139	200 SF/UTP CAT.5e LSZH FLEX	4 x 2 x AWG26/7	6.0	22	36
2170142	600 S/FTP CAT.7 LSZH FLEX	4 x 2 x AWG26/7	6.2	21	40

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the defi nition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: Coil 100 m; Drum (500; 1000) m
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- Field-Terminable Connector RJ45 CAT.5e FM45 refer to main catalogue 2018/19
- EPIC® DATA RJ45 refer to page 173
- EPIC® DATA 90 RJ45 Cat.6_A refer to main catalogue 2018/19

NEW

ETHERLINE® LAN RJ45 Cat.6$_A$

Double shielded S/FTP office patchcords RJ45 Cat.6$_A$

Info

- With flexible anti-kink protection and simple mechanism to unlock

Benefits

- Improved bending and anti-kink protection for lower bending radii without damage
- Stable locking lugs
- Gold plated contacts
- High EMC protection
- Different colors for the assignment of different applications

Application range

- Connecting- and Patchcable for use in structered building cabling acc. to ISO/IEC 11801 and EN 50173 (2nd Version)
- For use in the workplace (tertiary area) to connect various devices within the scope of „Structured Cabling“
- Suited for all applications of classes D to F Multimedia (video, data, voice)> 10 GbE acc. to IEEE802.3 (cable sharing, VoIP)

Product features

- Backward compatible

Norm references / Approvals

- Halogen-free according to IEC 60754-1/2
- Flame retardant acc. to IEC 60332-1-2
- Connector acc. to IEC 60603-7-51

Product Make-up

- Braided conductor, 4x2x AWG27/7
- Core insulation: cellular-PE
- S/FTP: copper braid as overall screening and pair screening with aluminium compound foil
- Outer sheath made of flameretardant, halogenfree compound, 5.7mm in diameter

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001262
ETIM 5.0/6.0 Class-Description: Patch cord copper (twisted pair)

Minimum bending radius
In operation: 5 x outer diameter

Protection rating
IP20

Temperature range
-20°C to +60°C

Length (m)	black	grey	blue	white	green	yellow	red
0.25	24441300	24441302	24441301	24441304	24441296	24441305	24441303
0.5	24441240	24441200	24441224	24441248	24441216	24441232	24441208
1	24441241	24441201	24441225	24441249	24441217	24441233	24441209
1.5	24441242	24441202	24441226	24441250	24441218	24441234	24441210
2	24441243	24441203	24441227	24441251	24441219	24441235	24441211
3	24441244	24441204	24441228	24441252	24441220	24441236	24441212
5	24441245	24441205	24441229	24441253	24441221	24441237	24441213
7.5	24441246	24441206	24441230	24441254	24441222	24441238	24441214
10	24441247	24441207	24441231	24441255	24441223	24441239	24441215

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Details of the clamping force are available upon request, halogen-free.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Connector RJ45 CAT.6 Hirose TM21

Product features

- Channel Class E up to 250 MHz (CAT.6)
- Fully screened
- Includes: bend protection and guide plate
- Anti-kink protection: beige

Technical data

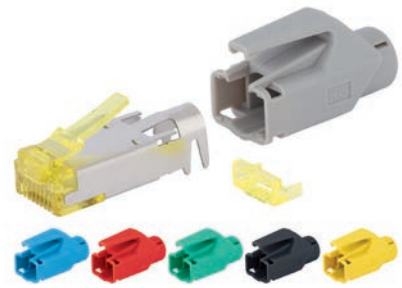
Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002641
ETIM 5.0/6.0 Class-Description: Modular connector (industrial connector)

Ambient temperature (operation)
-25°C .. +60°C

Article number	Article designation	Max. outer diameter (mm)	Min. Core diameter in mm	Max. Core diameter in mm	AWG 7-wire
Connector RJ45 CAT.6 Hirose TM21					
CE6324	Connector RJ45 CAT.6 Hirose TM21	6,6	0,9	1,0	27 - 24

Hirose is a registered trademark of the HIROSE ELECTRIC Group
Other colours are available upon request.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Connector RJ45 Cat.6$_A$ Hirose TM31



Product features

- Channel class E_A up to 500 MHz (CAT.6 $_A$)
- Includes: bend protection and guide plate
- Fully screened

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002641
ETIM 5.0/6.0 Class-Description: Modular connector (industrial connector)

Ambient temperature (operation)
-25°C .. +60°C

Article number	Article designation	Max. outer diameter (mm)	Min. Core diameter in mm	Max. Core diameter in mm	AWG 7-wire
Connector RJ45 Cat.6$_A$ Hirose TM31					
24441256	RJ45 connector TM31 Hirose Cat.6$_A$ GY	6,6	0,9	1,0	27 - 24
24441258	RJ45 connector TM31 Hirose Cat.6$_A$ BK	6,6	0,9	1,0	27 - 24
24441259	RJ45 connector TM31 Hirose Cat.6$_A$ RD	6,6	0,9	1,0	27 - 24
24441260	RJ45 connector TM31 Hirose Cat.6$_A$ GN	6,6	0,9	1,0	27 - 24
24441261	RJ45 connector TM31 Hirose Cat.6$_A$ BU	6,6	0,9	1,0	27 - 24
24441262	RJ45 connector TM31 Hirose Cat.6$_A$ YE	6,6	0,9	1,0	27 - 24

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Hirose is a registered trademark of the HIROSE ELECTRIC Group

Crimping tool RJ45 Hirose

Product features

- Crimping tool for RJ45 connector Hirose TM11 TM21 and TM31

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000385
ETIM 5.0/6.0 Class-Description: Special tool for telecommunication technique

Article number	Article designation
Crimping tool RJ45 Hirose	
CE5091	Crimping tool RJ45 Hirose 8-polig

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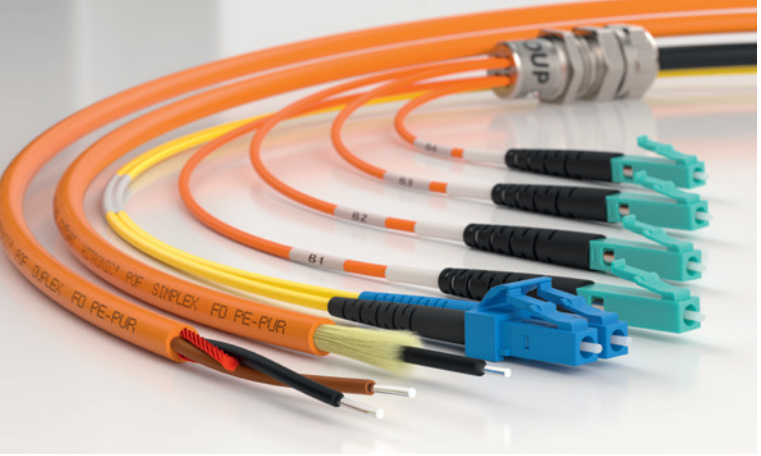

HITRONIC®

Optical transmission systems

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HITRONIC® HQW-Plus Armoured Outdoor Cable 235
HITRONIC® HQA Aerial Cable 236
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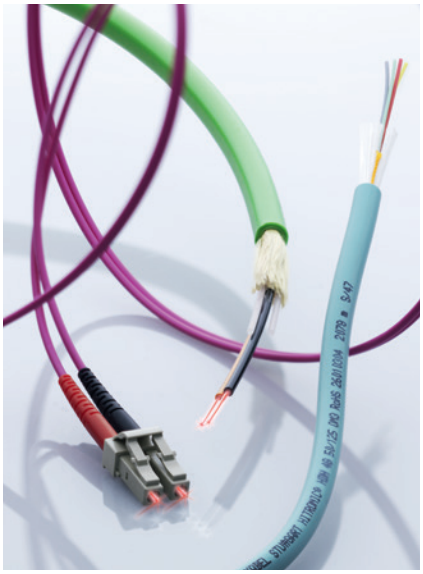
Fibre optic technology – General

The optical transmission of signals in fibre optic cables functions according to the principle of “total reflection”. The reflection is attained by surrounding a light-conducting core with a sheath that is optically thinner – the light is totally reflected by the boundary surface of the sheath, enabling it to be guided through the fibre optic cable.

At a time when the demand for fast and secure communication networks is constantly growing, fibre optic cables are now an indispensable and irreplaceable communication medium.

Benefits of using fibre optic cables

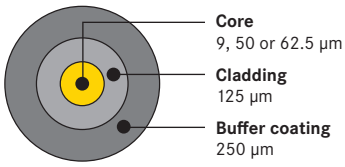
- Insensitivity to electromagnetic interference
- Electrical isolation of connected devices
- Low attenuation values
- Large transmission distances and high bandwidths
- Lightweight design
- Compact dimensions
- Can be installed in explosive environments
- High level of interception protection



GOF – Glass Optical Fibre

There are the following different types of fibres:

- Singlemode (SM) fibre, E9/125 OS2
- Multimode (MM) fibre, G62.5/125 OM1, G50/125 OM2 to OM4

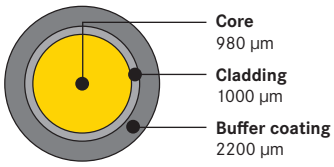


POF – Polymer Optical Fibre

- P980/1000

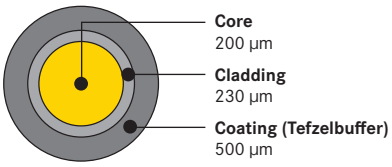
A distinction is made between the following application cases

- SIMPLEX (one buffered fibre)
- DUPLEX (two buffered fibres)



PCF – Plastic Cladded Fibre

- K200/230
- PCF – Plastic Cladded Fibre
- Also known as HCS (Hard Cladded Silica Optical Fibre)



Fibre type/ wavelength	max. attenuation [dB/km]				max. transmission length [m]				Colour
	650 nm	850 nm	1300 nm	1550 nm	650 nm	850 nm	1300 nm	1550 nm	
POF 980 µm	160				100 Mbit/s (PN): 50				
PCF 200 µm	10.0	8.0			100 Mbit/s (PN): 100				
GOF MM 62.5 µm OM1		3.5 (3.0)	1.5 (0.7)			100 Mbit/s: 550 1 Gbit/s: 275 10 Gbit/s: 33	100 Mbit/s: 2,000 1 Gbit/s: 550 10 Gbit/s: 300		Orange
GOF MM 50 µm OM2		3.5 (2.5)	1.5 (0.7)			100 Mbit/s: 550 1 Gbit/s: 550 10 Gbit/s: 82	100 Mbit/s: 2,000 1 Gbit/s: 550 10 Gbit/s: 300		Orange
GOF MM 50 µm OM3		3.5 (2.5)	1.5 (0.7)			1 Gbit/s: 1.000 10 Gbit/s: 300 40 Gbit/s: 100 100 Gbit/s: 100	1 Gbit/s: 550 10 Gbit/s: 300		Aqua
GOF MM 50 µm OM4		3.5 (2.5)	1.5 (0.7)			1 Gbit/s: 1.100 10 Gbit/s: 550 40 Gbit/s: 150 100 Gbit/s: 150	1 Gbit/s: 550 10 Gbit/s: 300		Violet
GOF SM 9 µm OS2 (G652.D)			0.40 (0.35)	0.40 (0.21)			40 Gbit/s: 10,000	40 Gbit/s: 40,000	Yellow

Photographs and graphics are not to scale and do not represent detailed images of the respective products.
For specific cable parameters see product pages or technical data sheets.

Colour-codes of fibres (loose tube) cabletypes

LAPP Standard		TIA/EIA-598 (Bellcore)		IEC60304 and DIN EN60794-1-1 (VDE0888-..)	
1	red	1	blue	1	red
2	green	2	orange	2	green
3	blue	3	green	3	blue
4	yellow	4	brown	4	yellow
5	grey	5	grey	5	white
6	violet	6	white	6	grey
7	brown	7	red	7	brown
8	orange	8	black	8	violet
9	white	9	yellow	9	turquoise
10	pink	10	violet	10	black
11	black	11	pink	11	orange
12	turquoise	12	turquoise	12	pink

If fibre 13 – 24 are used in a loose tube design, the color sequence is repeated for fibre 13 – 24, but fibres are ring marked.

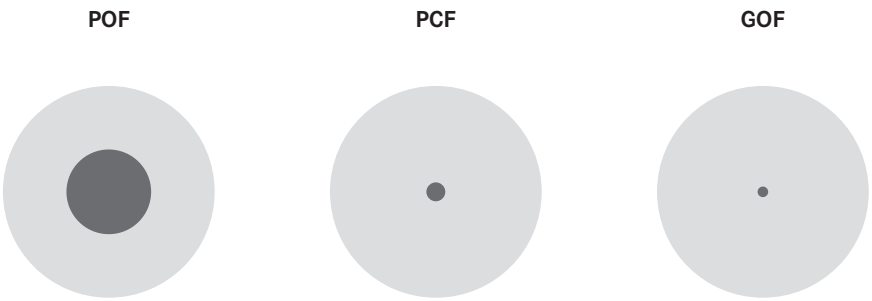
In terms of connectors, a distinction is made with regard to the fibre type and the application

Connector for fibre type POF
- Very easy to handle. Configurable by means of crimp or clamp connection
- Connector with inner bore > 1 mm at a fibre diameter of 1000 µm and pin diameter (ferrule) of 2.5 mm
- Tailored tool set for straightforward field configuration

Connector for fibre type PCF
- Easy to handle. Configurable by means of crimp and cleave technology
- Connector with inner bore > 230 µm at a fibre diameter of 230 µm and pin diameter (ferrule) of 2.5 mm
- Tailored tool set for straightforward field configuration

Connector for fibre type GOF
- Handling requires existing knowledge. Assembly by means of bonding and polishing process
- Connector with inner bore > 125 µm at a fibre diameter of 125 µm and pin diameter (ferrule) of 2.5 mm or 1.25 mm (depending on connector type)
- Assembly by qualified staff
- The use of pre-assembled cables is recommended

Schematic size comparison of connector pin (2.5 mm) and hole (POF – PCF – GOF)



When comparing the different connector holes with regard to the fibre diameter, it becomes apparent that these are not interchangeable with one another. In other words, a PCF connector cannot be used for a POF cable. A PCF connector cannot be used for a POF cable as the fibre geometries and parameters are not compatible with one another.

Selection criteria

Basic information needed to select cable

1. Where is it used?
Indoor
Outdoor
Indoor/Outdoor (Universal)

2. Type of applications
Mining
Railway
Wind Turbines
Inside Machines
Production or Processing Plants
Telecommunications
Power chains
Vertical installation
Oil & gas platforms
On ships

3. Type of Fibres
GOF Single-mode 9/125 µm OS2
Multimode 62.5/125 µm OM1
Multimode 50/125 µm OM2
Multimode 50/125 µm OM3
Multimode 50/125 µm OM4
PCF (200/230)
POF (980/1000)

4. No. of Fibres
GOF 2, 4, 6, 8, 12, 24 ... n x 12 (depend on cable type)
POF 1 (SIMPLEX), 2 (DUPLEX)
PCF 1 (SIMPLEX), 2 (DUPLEX)

Cable designations for optical cables according to DIN VDE 0888

□ – □□□□□□

1 2 3 4 5 6

1. Product application area

A	Outdoor cable
AT	Outdoor cable, divisible
J	Indoor cable
U or A/J	Universal cable (for outdoor and indoor)

2. Buffered fibre type

B	Loose tube, unfilled
D	Loose tube, filled
V	Tight-buffered fibre

3. Cable construction (in the cable from inside to outside)

B	Armouring
F	Grease-filled
Q	Swelling tape, dry core
(L)	Aluminium tape
S	Optical cable with copper elements
(SR)	Corrugated steel tape
(ZN)	Non-metallic strain relief elements
(ZS)	metallic strain relief elements

4. Sheath materials

H	Halogen-free sheath
Y	PVC sheath
2Y	PE sheath
4Y	PA sheath
11Y	PUR sheath

5. Number of fibres

X	Number of fibres or number of loose tubes X numbers of fibres per loose tube

6. Fibre type/fibre dimensions

E	Single-mode fibre (glass core/glass cladding) 9/125 µm SM GOF (OS2)
G	Multimode fibre (glass core/glass cladding) 50/125 µm or 62.5/125 µm MM GOF (OM1, OM2, OM3, OM4)
K	Plastic cladded fibre (glass core/plastic cladding) 200/230 µm PCF
P	Polymer optical fibre (polymer core/polymer cladding) 980/1000 µm POF

7. Optical quality/transmission properties

Example 1: A-DQ(ZN)(SR)2Y 12G 50/125 OM3
Outdoor cable with corrugated steel tape armour and PE sheath, central loose tube, non-metallic strain relief made of glass yarns, 12 fibres, 50/125 µm OM3 multimode fibres

Example 2: J-V2Y(ZN)11Y 2P 980/1000
Plastic fibre-optic cable, two-fibre (DUPLEX), indoor cable with PE inner sheath, non-metallic strain relief, PUR outer sheath

Article number coding for cables
(not applicable to accessories)

□□□□□□□□

A B C D1 D2

A. Group of fibres

6	GOF cables
7	GOF cables
8	POF/PCF cables

B. Installation area

0	Indoor
3	Universal, flexible
4	Universal
5	Universal, armoured
6	Outdoor
9	Outdoor, armoured

C. Type of fibres

0	POF 980/1000
1	GOF 62.5/125 OM1
2	GOF 50/125 OM2
3	GOF 50/125 OM3
4	GOF 50/125 OM4
7	PCF 200/230
9	GOF 9/125 OS2 (ITU-G652.D)

D. No. of fibres

01	SIMPLEX, 1 fibre
02	DUPLEX, 2 fibres
04	4 fibres
08	8 fibres
12	12 fibres
24	24 fibres
96	96 fibres
44	144 fibres

Example 1:
GOF outdoor cable,
HQN1500 24G 50/125 OM3 27600**324**

Example 2:
GOF armoured universal cable,
HUW1500 8E 9/125 OS2 27500**908**

Example 3:
POF cable,
POF SIMPLEX PE 28000**001**

Example 4:
POF cable,
POF DUPLEX PE-PUR 28020**002**

Example 5:
PCF outdoor cable,
PCF SIMPLEX Outdoor 28600**701**

Example 6:
PCF indoor cable,
PCF DUPLEX Indoor 28020**702**

Customized Pre-Assembled FO Cable Solutions

ÖLFLEX® CONNECT – Integrated Solutions made by LAPP

LAPP is offering an integrated solution with **ÖLFLEX® CONNECT** – cables assembled exactly to your requirements. Everything is possible – from traditional cable assemblies to industry standard servo connections right up to highly complex drag chain systems. With **ÖLFLEX® CONNECT** LAPP offers as well customized fibre optic system assemblies (FO trunks).

Customers can choose the right cable from the wide range of HITRONIC® fibre optic cables which can be assembled exactly as per customer specification.

By using factory assembled fibre optic cable solutions the installation for industry, telecommunication and office applications are significantly simplified.

Depending on the planning approach, time consuming connector installation or splicing at site can be avoided. Just lay the trunk system and simply plug it in with the factory pre-assembled connectors. **A plug & play solution from LAPP.**

Technical benefits

- No splice connections are necessary during installation. This saves time and costs for equipment and special tooling.
- Low attenuation values by factory preassembled plugs
- Trunk-system are easy to use without any further time consuming on-site processing
- Available with all major cable and connector types (LAPP HITRONIC® range)
- Ready to use fibre optic cabling system
- IP 68 metallic cable unit splitter for glass fibre (GOF) loose tube cables up to 48 fibres

In a few steps to a customized FO-trunk-system:

1. Determination of the required fibre type
- POF (980/1000)
- PCF (200/230)
- GOF (single-mode 9/125 OS2)
  (multimode 62,5/125 OM1)
  (multimode 50/125 OM2; OM3; OM4)

2. Selection of cable type and version
See HITRONIC® cable range
(POF, PCF and GOF and number of fibers)

3. Determination of the system length

4. Connector configuration
Selection of connector type – side 1 and 2

5. Cable pulling device
Selection cable pulling device side 1 and/or side 2

6. Specific requirements
Regarding packaging and marking

7. LAPP in-house
LAPP will check the technical feasibility and plausibility (fibre – cable – connector) and make a quotation

8. Easy ordering and fast shipping

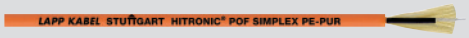
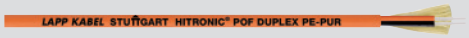
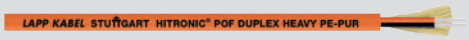
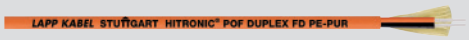
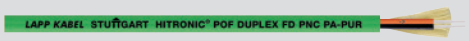
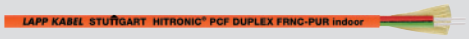
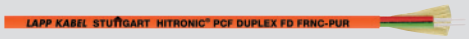
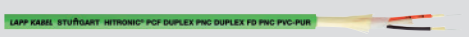
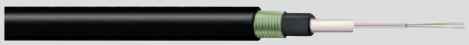
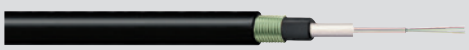
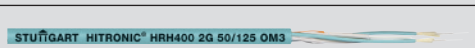
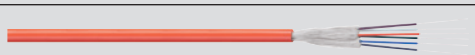
For questions about customized packaging and special issues we are happy to assist you.

Selection example:

Short designation:
TRUNK GOF HUN1500-4E9/125-SC/LC-85m

Description:
- Customized pre-assembled fibre optic cable solution
- Based on cable version HITRONIC® HUN 4E9/125 OS2
- Assembled at both ends with connectors
  - side 1: 2 x SC-duplex connector
  - side 2: 2 x LC-duplex connector
- Cable splitter unit IP68:
  - up to 24 fibres
  - M20 through hole
- Side 1 protected with a cable pulling device
  - outer diameter < 30 mm
- System length 85 m
- On disposable drum
- With test protocol

HITRONIC® Product Overview

Type of fibre	Cables	Article number	Page	
POF	POF SIMPLEX PE	28000001	208	
	POF DUPLEX PE	28000002	210	
	POF SIMPLEX PE-PUR	28020001	209	
	POF DUPLEX PE-PUR	28020002	211	
	POF DUPLEX Heavy	28030002	211	
	POF SIMPLEX/DUPLEX FD PE-PUR	28320001/28320002	209/211	
	POF DUPLEX for PROFINET® applications	28351002	212	
PCF	PCF SIMPLEX Outdoor	28600701	219	
	PCF DUPLEX Outdoor	28620702	220	
	PCF DUPLEX Indoor	28020702	220	
	PCF DUPLEX FD Universal	28320702	221	
	PCF DUPLEX for PROFINET® applications	28351702	222	
GOF	HITRONIC® FIRE	27560304	226	
	HITRONIC® TORSION	26310302	227	
	HRM-FD Flexible	26300402	229	
	HDM Reel	26610404	228	
	HQN Outdoor	27600304	231	
	HVN Stranded Outdoor	26600324	232	
	HVN-Mini Outdoor (air blowable)	26609912	230	
	HQW Armoured Outdoor	27900304	233	
	HVW Armoured Stranded Outdoor	26900924	234	
	HQW-Plus Armoured Outdoor	27920304	235	
	HQA Aerial ADSS	26640912	236	
	HQA-Plus Aerial ADSS	26644912	237	
	HUN Universal	27400404	238	
	HUW Armoured Universal	27500304	239	
	HRH Breakout	26000302	240	
	HDH Mini Breakout	26010302	241	

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Connectors and adapters

POF Connector
F05 Simplex
Art. no.: 29150099
Page: 214

POF Connector
and Adapter HFBR
Art. no.: 29140099
Page: 213

POF Adapter F-SMA
Art. no.: 29430099
Page: 215

POF Connector F-SMA
and ST (BFOC)
Art. no.: 29135099
Page: 214

POF Connector SC-RJ
Art. no.: 29161097
Page: 215

POF Adapter ST (BFOC)
Art. no.: 29420099
Page: 215

PCF Connector F-SMA and ST(BFOC)
Art. no.: 29136799 | Page: 223

PCF Connector HFBR
Art. no.: 29140799 | Page: 223

PCF Connector SC-RJ
Art. no.: 29166797
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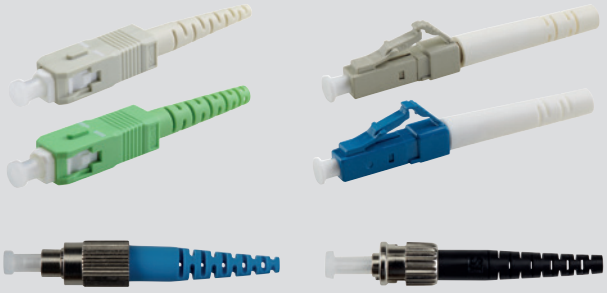
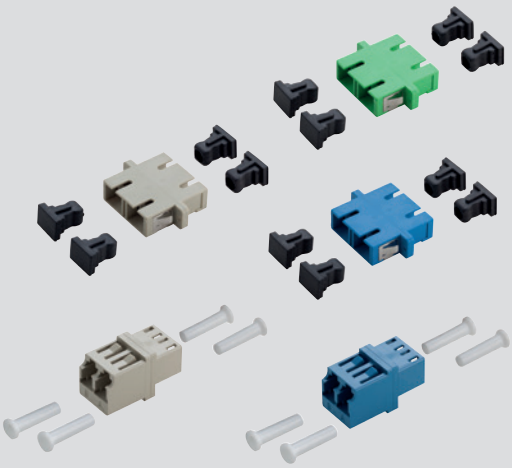


GOF Connector
Art. no.: 29110999 | Page: 244



GOF Adapters
Art. no.: 29410999 | Page: 245

Accessories

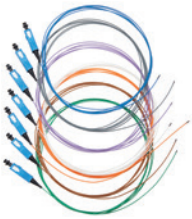
POF Assembly Sets
Art. no.: 29500001 | Page: 216

POF Measurement Equipment
Art. no.: 29500070 | Page: 218

PCF Assembly Sets
Art. no.: 29500701 | Page: 224

PCF Cutting Tools
Art. no.: 29500711/29500712 | Page: 225

GOF DUPLEX Patchcord
Art. no.: 29011402 | Page: 242

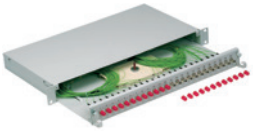


GOF SIMPLEX Pigtail
Art. no.: 29310402 | Page: 243

ÖLFLEX® CONNECT
Art.-Nr.: 74325966 | Page: 191

Accessories for splice boxes
and wall-mounted rack
Art. no.: CE9914 | Page: 248

Splice Box Compact
Art. no.: CE9147 | Page: 247



19" Splice Box for ST
Art. no.: CE9138 | Page: 246

Quickfinder

FO-fibre type	Cable type/standardisation (DIN VDE 0888)	Area of Installation	Cabling	Fibre Specification	No. of fibres	Outer sheath material
POF – Polymer Optical Fibre	J-V2Y 1P980/1000	Indoor (industrial & automation areas)	static	POF 980/100 µm	1 (SIMPLEX)	PE
	J-V2Y(ZN)11Y 1P980/1000				1 (SIMPLEX)	PUR
	J-V2Y 2P980/1000			POF 980/1000 µm	2 (DUPLEX)	PE
	J-V2Y(ZN)11Y 2P980/1000				2 (DUPLEX)	PUR
	J-V2Y(ZN)11Y 2P980/1000				2 (DUPLEX)	
	J-V2Y(ZN)11Y 1P980/1000 flex		highly flexible	POF 980/1000 µm	1 (SIMPLEX)	PUR
	J-V2Y(ZN)11Y 2P980/1000 flex				2 (DUPLEX)	
	J-V4Y(ZN)11Y 2P980/1000	Industry and automation PROFINET®	static, Type B	POF 980/1000 µm	2 (DUPLEX)	PUR
	J-V4Y(ZN)Y 2P980/1000			POF 980/1000 µm	2 (DUPLEX)	PVC
	J-V4Y(ZN)11Y 2P980/1000 flex		highly flexible, Type C	POF 980/1000 µm	2 (DUPLEX)	PUR
PCF – Polymer Cladded Fibre	A-V(ZN)11Y 1K200/230	Outdoor	static	PCF 200/230 µm	1 (SIMPLEX)	PUR
	AT-VQ(ZN)HB2Y 2K200/230				2 (DUPLEX)	PE
	J-V(ZN)H11Y 2K200/230	Indoor	static	PCF 200/230 µm	2 (DUPLEX)	PUR
	A/J-V(ZN)H11Y 2K200/230 flex	Universal	highly flexible	PCF 200/230 µm	2 (DUPLEX)	PUR
	AT-V(ZN)YY 2K200/230	Industry and automation PROFINET®	static, Type B	PCF 200/230 µm	2 (DUPLEX)	PVC
	AT-V(ZN)YY 2K200/230 (with UL-listing)			PCF 200/230 µm	2 (DUPLEX)	
	AT-V(ZN)Y(ZN)Y 2K200/230 flex		highly flexible, Type C	PCF 200/230 µm	2 (DUPLEX)	PVC
	AT-V(ZN)Y(ZN)11Y 2K200/230 flex			PCF 200/230 µm	2 (DUPLEX)	PUR

FO-fibre type	Cable type/standardisation (DIN VDE 0888)	Area of Installation	Cabling	Fibre Specification	No. of fibres	Max. tensile force (long-term) in [N]	Outer sheath material
GOF – Glass Opical Fibre	Outdoor Cable A-DQ(ZN)B2Y (loose tube, 4 – 24 fibres)	Outdoor	static	Multimode 50/125 µm OM3	4	1500	PE
					8		
					12		
					24		
				Multimode 50/125 µm OM2	4	1500	PE
					8		
					12		
					24		
				Multimode 62.5/125 µm OM1	4	1500	PE
					8		
					12		
					24		
				Singlemode 9/125 µm OS2	4	1500	PE
					8		
					12		
					24		

Please see detailed technical information on the data sheet (www.lappgroup.com/products).
Multimode OM4 fibres are also available upon request for all GOF cables.

Product Benefits	Article designation	Article number	Page
fibre sheath halogen-free, non-ageing, direct connector assembly	HITRONIC® POF SIMPLEX PE	28000001	208
PUR outer sheath halogen-free, flame-retardant, direct connector assembly	HITRONIC® POF SIMPLEX PE-PUR	28020001	209
fibre sheath halogen-free, non-ageing, direct connector assembly	HITRONIC® POF DUPLEX PE	28000002	210
PUR outer sheath halogen-free, flame-retardant, direct connector assembly	HITRONIC® POF DUPLEX PE-PUR	28020002	211
thicker outer sheath for increased mechanical resistance, halogen-free	HITRONIC® POF DUPLEX HEAVY PE-PUR	28030002	211
power chain, for highly flexible industrial applications, halogen-free outer sheath	HITRONIC® POF SIMPLEX FD PE-PUR	28320001	209
power chain, for highly flexible industrial applications, halogen-free outer sheath	HITRONIC® POF DUPLEX FD PE-PUR	28320002	211
PROFINET® compliant Type B, PA fibre buffer, PUR outer sheath, halogen-free, for high mechanical or chemical stress in industrial environments	HITRONIC® POF DUPLEX PNB PA-PUR	28051002	212
PROFINET® compliant Type B, PA fibre buffer, PVC outer sheath, for standard applications in industrial environments	HITRONIC® POF DUPLEX PNB PA-PVC	28052002	212
PROFINET® compliant Type C, PA fibre buffer, PUR outer sheath, halogen-free, for flexible applications (power chain)	HITRONIC® POF DUPLEX FD PNC PA-PUR	28351002	212
PUR outer sheath, flame-retardant and halogen-free outer sheath, for direct connector assembly	HITRONIC® PCF SIMPLEX PUR Outdoor	28600701	219
compatible with all typical BUS systems, FRNC SIMPLEX sheath (diameter: 2.9 mm), PE outer sheath, low-smoke and halogen-free outer sheath, for direct connector assembly	HITRONIC® PCF DUPLEX FRNC-PE Outdoor	28620702	220
compatible with all typical BUS systems, FRNC SIMPLEX sheath (diameter: 2.9 mm), PUR outer sheath, low-smoke and halogen-free outer sheath, for direct connector assembly	HITRONIC® PCF DUPLEX FRNC-PUR Indoor	28020702	220
power chain, compatible with all typical BUS systems, for highly flexible industrial applications, FRNC SIMPLEX sheath (diameter: 2.2mm), halogen-free outer sheath, for direct connector assembly	HITRONIC® PCF DUPLEX FD FRNC-PUR	28320702	221
PROFINET® compliant Type B, PVC SIMPLEX sheath (2.2 mm), PVC outer sheath, for standard applications in industrial environments, for direct connector assembly	HITRONIC® PCF DUPLEX PNB PVC-PVC	28052702	222
PROFINET® compliant Type B, PVC SIMPLEX sheath (2.2 mm), PVC outer sheath, for standard applications in industrial environments, for direct connector assembly, c(UL)us OFNG 75 °C	HITRONIC® PCF DUPLEX PNB PVC-PVC A	28055702	222
PROFINET® compliant Type C, PVC SIMPLEX sheath (2.2 mm), PVC outer sheath, for flexible applications (power chain)	HITRONIC® PCF DUPLEX FD PNC PVC-PVC	28352702	222
PROFINET® compliant Type C, PVC SIMPLEX sheath (2.2 mm), PUR outer sheath, halogen-free, for flexibe applications (power chain)	HITRONIC® PCF DUPLEX FD PNC PVC-PUR	28351702	222

Product Benefits	Article designation	Article number	Page
compact, central loose tube, direct burial, UV resistance, halogen-free, rodent and moisture protection, watertight, low friction	HITRONIC® HQN1500 4 G 50/125 OM3	27600304	231
	HITRONIC® HQN1500 8 G 50/125 OM3	27600308	231
	HITRONIC® HQN1500 12 G 50/125 OM3	27600312	231
	HITRONIC® HQN1500 24 G 50/125 OM3	27600324	231
compact, central loose tube, direct burial, UV resistance, halogen-free, rodent and moisture protection, watertight, low friction	HITRONIC® HQN1500 4 G 50/125 OM2	27600204	231
	HITRONIC® HQN1500 8 G 50/125 OM2	27600208	231
	HITRONIC® HQN1500 12 G 50/125 OM2	27600212	231
	HITRONIC® HQN1500 24 G 50/125 OM2	27600224	231
compact, central loose tube, direct burial, UV resistance, halogen-free, rodent and moisture protection, watertight, low friction	HITRONIC® HQN1500 4 G 62.5/125 OM1	27600104	231
	HITRONIC® HQN1500 8 G 62.5/125 OM1	27600108	231
	HITRONIC® HQN1500 12 G 62.5/125 OM1	27600112	231
	HITRONIC® HQN1500 24 G 62.5/125 OM1	27600124	231
compact, central loose tube, direct burial, UV resistance, halogen-free, rodent and moisture protection, watertight, low friction	HITRONIC® HQN1500 4 E9/125 OS2	27600904	231
	HITRONIC® HQN1500 8 E9/125 OS2	27600908	231
	HITRONIC® HQN1500 12 E9/125 OS2	27600912	231
	HITRONIC® HQN1500 24 E9/125 OS2	27600924	231

Continuation see page 196

Quickfinder [Continuation]

FO-fibre type	Cable type/standardisation (DIN VDE 0888)	Area of Installation	Cabling	Fibre Specification	No. of fibres	Max. tensile force (long-term) in [N]	Outer sheath material
GOF – Glass Opical Fibre	Outdoor Cable A-DQ(ZN)B2Y (loose tube, 12 – 144 fibres)	Outdoor	static	Multimode 50/125 µm OM2	24	1500	PE
					48		
				Multimode 62.5/125 µm OM1	24		
					48		
				Singlemode 9/125 µm OS2	12	1500	PE
					24		
					48		
					72	2000	
					96		
					144		
	Outdoor Cable A-DQ(ZN)2Y (stranded loose tubes, 12 – 144 fibres, compact)	Outdoor, MicroDuct systems	static, blowing technology	Singlemode 9/125 µm OS2	12	500	PE
					24		
					48		
					72		
					96	1200	
					144	1500	
	Armoured Outdoor Cable A-DQ(ZN)(SR)2Y (loose tube, 4 – 24 fibres)	Outdoor	static	Multimode 50/125 µm OM3	4	3000	PE
					8		
					12		
					24		
				Multimode 50/125 µm OM2	4	3000	PE
					8		
					12		
					24		
				Multimode 62.5/125 µm OM1	4	3000	PE
					8		
					12		
					24		
				Singlemode 9/125 µm OS2	4	3000	PE
					8		
					12		
					24		
	Universal Cable A/J-DQ(ZN)BH U-DQ(ZN)BH (loose tube, 4 – 24 fibres)	Indoor/Outdoor	static	Multimode 50/125 µm OM3	4	1500	LSZH
					8		
					12		
					24		
				Multimode 50/125 µm OM2	4	1500	LSZH
					8		
					12		
					24		
				Multimode 62.5/125 µm OM1	4	1500	LSZH
					8		
					12		
					24		
				Singlemode 9/125 µm OS2	4	1500	LSZH
					8		
					12		
					24		

Please see detailed technical information on the data sheet (www.lappgroup.com/products).
Multimode OM4 fibres are also available upon request for all GOF cables.

Product Benefits	Article designation	Article number	Page
compact, stranded loose tubes, UV resistance, halogen-free, rodent and moisture protection, low friction, suitable for blowing technology	HITRONIC® HVN5000 2x12G 50/125 OM3	26600324	232
	HITRONIC® HVN5000 4x12G 50/125 OM3	26600348	232
	HITRONIC® HVN5000 2x12G 50/125 OM2	26600224	232
	HITRONIC® HVN5000 4x12G 50/125 OM2	26600248	232
compact, stranded loose tubes, UV resistance, halogen-free, rodent and moisture protection, low friction, suitable for blowing technology	HITRONIC® HVN1500 2x6 E9/125 OS2	26601912	232
	HITRONIC® HVN1500 2x12 E9/125 OS2	26601924	232
	HITRONIC® HVN1500 4x12 E9/125 OS2	26601948	232
	HITRONIC® HVN2000 6x12 E9/125 OS2	26601972	232
	HITRONIC® HVN2000 8x12 E9/125 OS2	26601996	232
	HITRONIC® HVN2000 12x12 E9/125 OS2	26601944	232
compact, stranded loose tubes, reduced dimensions, UV resistance, halogen-free, moisture protection, low friction, suitable for blowing technology	HITRONIC® HVN-Mini500 1x12 E9/125 OS2	26609912	230
	HITRONIC® HVN-Mini500 2x12 E9/125 OS2	26609924	230
	HITRONIC® HVN-Mini500 4x12 E9/125 OS2	26609948	230
	HITRONIC® HVN-Mini500 6x12 E9/125 OS2	26609972	230
	HITRONIC® HVN-Mini1200 8x12 E9/125 OS2	26609996	230
	HITRONIC® HVN-Mini1000 12x12 E9/125 OS2	26609944	230
compact, central loose tube, metallic armoured (corrugated steel tape), higher mechanical and chemical resistance, excellent rodent protection, halogen-free, UV resistance, moisture protected, watertight, low friction	HITRONIC® HQW3000 4 G 50/125 OM3	27900304	233
	HITRONIC® HQW3000 8 G 50/125 OM3	27900308	233
	HITRONIC® HQW3000 12 G 50/125 OM3	27900312	233
	HITRONIC® HQW3000 24 G 50/125 OM3	27900324	233
compact, central loose tube, metallic armoured (corrugated steel tape), higher mechanical and chemical resistance, excellent rodent protection, halogen-free, UV resistance, moisture protected, watertight, low friction	HITRONIC® HQW3000 4 G 50/125 OM2	27900204	233
	HITRONIC® HQW3000 8 G 50/125 OM2	27900208	233
	HITRONIC® HQW3000 12 G 50/125 OM2	27900212	233
	HITRONIC® HQW3000 24 G 50/125 OM2	27900224	233
compact, central loose tube, metallic armoured (corrugated steel tape), higher mechanical and chemical resistance, excellent rodent protection, halogen-free, UV resistance, moisture protected, watertight, low friction	HITRONIC® HQW3000 4 G 62.5/125 OM1	27900104	233
	HITRONIC® HQW3000 8 G 62.5/125 OM1	27900108	233
	HITRONIC® HQW3000 12 G 62.5/125 OM1	27900112	233
	HITRONIC® HQW3000 24 G 62.5/125 OM1	27900124	233
compact, central loose tube, metallic armoured (corrugated steel tape), higher mechanical and chemical resistance, excellent rodent protection, halogen-free, UV resistance, moisture protected, watertight, low friction	HITRONIC® HQW3000 4 E9/125 OS2	27900904	233
	HITRONIC® HQW3000 8 E9/125 OS2	27900908	233
	HITRONIC® HQW3000 12 E9/125 OS2	27900912	233
	HITRONIC® HQW3000 24 E9/125 OS2	27900924	233
compact, flexible, central loose tube, flame retardant, low smoke emission, UV resistance, halogen-free, rodent and moisture protection, watertight	HITRONIC® HUN1500 4 G 50/125 OM3	27400304	238
	HITRONIC® HUN1500 8 G 50/125 OM3	27400308	238
	HITRONIC® HUN1500 12 G 50/125 OM3	27400312	238
	HITRONIC® HUN1500 24 G 50/125 OM3	27400324	238
compact, flexible, central loose tube, flame retardant, low smoke emission, UV resistance, halogen-free, rodent and moisture protection, watertight	HITRONIC® HUN1500 4 G 50/125 OM2	27400204	238
	HITRONIC® HUN1500 8 G 50/125 OM2	27400208	238
	HITRONIC® HUN1500 12 G 50/125 OM2	27400212	238
	HITRONIC® HUN1500 24 G 50/125 OM2	27400224	238
compact, flexible, central loose tube, flame retardant, low smoke emission, UV resistance, halogen-free, rodent and moisture protection, watertight	HITRONIC® HUN1500 4 G 62.5/125 OM1	27400104	238
	HITRONIC® HUN1500 8 G 62.5/125 OM1	27400108	238
	HITRONIC® HUN1500 12 G 62.5/125 OM1	27400112	238
	HITRONIC® HUN1500 24 G 62.5/125 OM1	27400124	238
compact, flexible, central loose tube, flame retardant, low smoke emission, UV resistance, halogen-free, rodent and moisture protection, watertight	HITRONIC® HUN1500 4 E9/125 OS2	27400904	238
	HITRONIC® HUN1500 8 E9/125 OS2	27400908	238
	HITRONIC® HUN1500 12 E9/125 OS2	27400912	238
	HITRONIC® HUN1500 24 E9/125 OS2	27400924	238

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Quickfinder [Continuation]

FO-fibre type	Cable type/standardisation (DIN VDE 0888)	Area of Installation	Cabling	Fibre Specification	No. of fibres	Max. tensile force (long-term) in [N]	Outer sheath material
GOF – Glass Opical Fibre	Armoured Universal Cable A/J-DQ(ZN)(SR)BH U-DQ(ZN)(SR)BH (loose tube, 4 – 24 fibres)	Indoor/Outdoor	static	Multimode 50/125 µm OM3	4	1500	LSZH
					8		
					12		
					24		
				Multimode 50/125 µm OM2	4	1500	LSZH
					8		
					12		
					24		
				Multimode 62.5/125 µm OM1	4	1500	LSZH
					8		
					12		
					24		
				Singlemode 9/125 µm OS2	4	1500	LSZH
					8		
					12		
					24		
	Breakout Cable J-V(ZN)HH (tight buffer, 2 – 12 fibres)	Indoor	static	Multimode 50/125 µm OM4	2	400	LSZH
					4	600	
					8	1200	
					12	1700	
				Multimode 50/125 µm OM3	2	400	LSZH
					4	600	
					8	1200	
					12	1700	
				Multimode 50/125 µm OM2	2	400	LSZH
					4	600	
					8	1200	
					12	1700	
				Multimode 62.5/125 µm OM1	2	400	LSZH
					4	600	
					8	1200	
					12	1700	
	Breakout Cable J-V(ZN)HH (tight buffer, 2 – 12 fibres)	Indoor	static	Singlemode 9/125 µm OS2	2	400	LSZH
					4	600	
					8	1200	
					12	1700	
	Mini Breakout Cable J-V(ZN)H (tight buffer, 2 – 12 fibres)	Indoor	static	Multimode 50/125 µm OM4	2	650	LSZH
					4		
					8	850	
					12		
				Multimode 50/125 µm OM3	2	650	LSZH
					4		
					8	850	
					12		
				Multimode 50/125 µm OM2	2	650	LSZH
					4		
					8	850	
					12		
				Multimode 62.5/125 µm OM1	2	650	LSZH
					4		
					8	850	
					12		

Please see detailed technical information on the data sheet (www.lappgroup.com/products).
Multimode OM4 fibres are also available upon request for all GOF cables.

Product Benefits	Article designation	Article number	Page
metallic armoured (corrugated steel tape), excellent rodent protection, flame retardant, low smoke emission, halogen-free, moisture protection, watertight	HITRONIC® HUW1500 4 G 50/125 OM3	27500304	239
	HITRONIC® HUW1500 8 G 50/125 OM3	27500308	239
	HITRONIC® HUW1500 12 G 50/125 OM3	27500312	239
	HITRONIC® HUW1500 24 G 50/125 OM3	27500324	239
metallic armoured (corrugated steel tape), excellent rodent protection, flame retardant, low smoke emission, halogen-free, moisture protection, watertight	HITRONIC® HUW1500 4 G 50/125 OM2	27500204	239
	HITRONIC® HUW1500 8 G 50/125 OM2	27500208	239
	HITRONIC® HUW1500 12 G 50/125 OM2	27500212	239
	HITRONIC® HUW1500 24 G 50/125 OM2	27500224	239
metallic armoured (corrugated steel tape), excellent rodent protection, flame retardant, low smoke emission, halogen-free, moisture protection, watertight	HITRONIC® HUW1500 4 G 62.5/125 OM1	27500104	239
	HITRONIC® HUW1500 8 G 62.5/125 OM1	27500108	239
	HITRONIC® HUW1500 12 G 62.5/125 OM1	27500112	239
	HITRONIC® HUW1500 24 G 62.5/125 OM1	27500124	239
metallic armoured (corrugated steel tape), excellent rodent protection, flame retardant, low smoke emission, halogen-free, moisture protection, watertight	HITRONIC® HUW1500 4 E9/125 OS2	27500904	239
	HITRONIC® HUW1500 8 E9/125 OS2	27500908	239
	HITRONIC® HUW1500 12 E9/125 OS2	27500912	239
	HITRONIC® HUW1500 24 E9/125 OS2	27500924	239
halogen-free, flame-retardant, low smoke emission, easy to handle, highly flexible, suitable for direct connector assembly, SIMPLEX sheath diameter: 2.1 mm	HITRONIC® HRH400 2 G 50/125 OM4	26000402	240
	HITRONIC® HRH600 4 G 50/125 OM4	26000404	240
	HITRONIC® HRH1200 8 G 50/125 OM4	26000408	240
	HITRONIC® HRH1700 12 G 50/125 OM4	26000412	240
halogen-free, flame-retardant, low smoke emission, easy to handle, highly flexible, suitable for direct connector assembly, SIMPLEX sheath diameter: 2.1 mm	HITRONIC® HRH400 2 G 50/125 OM3	26000302	240
	HITRONIC® HRH600 4 G 50/125 OM3	26000304	240
	HITRONIC® HRH1200 8 G 50/125 OM3	26000308	240
	HITRONIC® HRH1700 12 G 50/125 OM3	26000312	240
halogen-free, flame-retardant, low smoke emission, easy to handle, highly flexible, suitable for direct connector assembly, SIMPLEX sheath diameter: 2.1 mm	HITRONIC® HRH400 2 G 50/125 OM2	26000202	240
	HITRONIC® HRH600 4 G 50/125 OM2	26000204	240
	HITRONIC® HRH1200 8 G 50/125 OM2	26000208	240
	HITRONIC® HRH1700 12 G 50/125 OM2	26000212	240
halogen-free, flame-retardant, low smoke emission, easy to handle, highly flexible, suitable for direct connector assembly, SIMPLEX sheath diameter: 2.1 mm	HITRONIC® HRH400 2 G 62.5/125 OM1	26000102	240
	HITRONIC® HRH600 4 G 62.5/125 OM1	26000104	240
	HITRONIC® HRH1200 8 G 62.5/125 OM1	26000108	240
	HITRONIC® HRH1700 12 G 62.5/125 OM1	26000112	240
halogen-free, flame-retardant, low smoke emission, easy to handle, highly flexible, suitable for direct connector assembly, SIMPLEX sheath diameter: 2.1 mm	HITRONIC® HRH400 2 E9/125 OS2	26000902	240
	HITRONIC® HRH600 4 E9/125 OS2	26000904	240
	HITRONIC® HRH1200 8 E9/125 OS2	26000908	240
	HITRONIC® HRH1700 12 E9/125 OS2	26000912	240
halogen-free, flame-retardant, low smoke emission, easy to handle, suitable for direct connector assembly, tight buffer fibre diameter: 900 µm	HITRONIC® HDH 2 G 50/125 OM4	26010402	241
	HITRONIC® HDH 4 G 50/125 OM4	26010404	241
	HITRONIC® HDH 8 G 50/125 OM4	26010408	241
	HITRONIC® HDH 12 G 50/125 OM4	26010412	241
halogen-free, flame-retardant, low smoke emission, easy to handle, suitable for direct connector assembly, tight buffer fibre diameter: 900 µm	HITRONIC® HDH 2 G 50/125 OM3	26010302	241
	HITRONIC® HDH 4 G 50/125 OM3	26010304	241
	HITRONIC® HDH 8 G 50/125 OM3	26010308	241
	HITRONIC® HDH 12 G 50/125 OM3	26010312	241
halogen-free, flame-retardant, low smoke emission, easy to handle, suitable for direct connector assembly, tight buffer fibre diameter: 900 µm	HITRONIC® HDH 2 G 50/125 OM2	26010202	241
	HITRONIC® HDH 4 G 50/125 OM2	26010204	241
	HITRONIC® HDH 8 G 50/125 OM2	26010208	241
	HITRONIC® HDH 12 G 50/125 OM2	26010212	241
halogen-free, flame-retardant, low smoke emission, easy to handle, suitable for direct connector assembly, tight buffer fibre diameter: 900 µm	HITRONIC® HDH 2 G 62.5/125 OM1	26010102	241
	HITRONIC® HDH 4 G 62.5/125 OM1	26010104	241
	HITRONIC® HDH 8 G 62.5/125 OM1	26010108	241
	HITRONIC® HDH 12 G 62.5/125 OM1	26010112	241

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FO-fibre type	Cable type/standardisation (DIN VDE 0888)	Area of Installation	Cabling	Fibre Specification	No. of fibres	Max. tensile force (long-term) in [N]	Outer sheath material
GOF – Glass Optical Fibre Cables for Special Applications	Fire-Resistant Cable Universal cable with special properties in case of fire A/J-DQ(ZN)BH(SR)H, U-DQ(ZN)BH(SR)H, armoured loose tube cable (4 – 24 fibres)	Universal (indoor and outdoor), safety area, tunnels	static	Multimode 50/125 µm OM3	4	1500	LSZH
					8		
					12		
					24		
				Multimode 50/125 µm OM2	4	1500	LSZH
					8		
					12		
					24		
				Multimode 62.5/125 µm OM2	4	1500	LSZH
					8		
					12		
					24		
				Singlemode 9/125 µm OS2	4	1500	LSZH
					8		
					12		
					24		
	Torsion-Resistant Breakout Cable A/J-V(ZN)H11Y flexible (tight buffer, 2 – 12 fibres)	Universal (indoor and outdoor), Torsion, flexible application	flexible (Torsion)	Multimode 50/125 µm OM2	2	600	PUR
					4	800	
					8	1600	
					12	2400	
				Multimode 62.5/125 µm OM1	2	600	PUR
					4	800	
					8	1600	
					12	2400	
	highly flexible drag chain Breakout cable A/J-V(ZN)H(ZN)11Y (tight buffer, 2 – 12 fibres)	Universal, industrial area	flexible, moving (drag chain)	Multimode 50/125 µm OM4	4	1000	PUR
				Multimode 50/125 µm OM3			
				Multimode 50/125 µm OM2			
				Multimode 62.5/125 µm OM1			
				Singlemode 9/125 µm OS2			
	Reelable Mini Breakout Cable A/ J-V(ZN)11Y flexible (tight buffer, 4, 6, 8 fibres)	Universal, industrial area, event technology	flexible (for frequent reeling)	Multimode 50/125 µm OM4	4	600	PUR
					6		
					8	700	
				Multimode 50/125 µm OM3	4	600	PUR
					6		
					8	700	
				Multimode 50/125 µm OM2	4	600	PUR
					6		
					8	700	
				Multimode 62.5/125 µm OM1	4	600	PUR
					6		
					8	700	

Please see detailed technical information on the data sheet (www.lappgroup.com/products).
Multimode OM4 fibres are also available upon request for all GOF cables.

Product Benefits	Article designation	Article number	Page
Safety fire-resistant fibre optical cable with system integrity for 180 min, halogen-free, flame-retardant, low smoke emission cable sheath, metallic armoured (corrugated steel tape)	HITRONIC® FIRE 4G50/125 OM3	27560304	226
	HITRONIC® FIRE 8G50/125 OM3	27560308	226
	HITRONIC® FIRE 12G50/125 OM3	27560312	226
	HITRONIC® FIRE 24G50/125 OM3	27560324	226
Safety fire-resistant fibre optical cable with system integrity for 180 min, halogen-free, flame-retardant, low smoke emission cable sheath, metallic armoured (corrugated steel tape)	HITRONIC® FIRE 4G50/125 OM2	27560204	226
	HITRONIC® FIRE 8G50/125 OM2	27560208	226
	HITRONIC® FIRE 12G50/125 OM2	27560212	226
	HITRONIC® FIRE 24G50/125 OM2	27560224	226
Safety fire-resistant fibre optical cable with system integrity for 180 min, halogen-free, flame-retardant, low smoke emission cable sheath, metallic armoured (corrugated steel tape)	HITRONIC® FIRE 4G62.5/125 OM1	27560104	226
	HITRONIC® FIRE 8G62.5/125 OM1	27560108	226
	HITRONIC® FIRE 12G62.5/125 OM1	27560112	226
	HITRONIC® FIRE 24G62.5/125 OM1	27560124	226
Safety fire-resistant fibre optical cable with system integrity for 180 min, halogen-free, flame-retardant, low smoke emission cable sheath, metallic armoured (corrugated steel tape)	HITRONIC® FIRE 4E9/125 OS2	27560904	226
	HITRONIC® FIRE 8E9/125 OS2	27560908	226
	HITRONIC® FIRE 12E9/125 OS2	27560912	226
	HITRONIC® FIRE 24E9/125 OS2	27560924	226
Fibre optical cables for wind applications with defined movement, torsion with robust PUR sheath, breakout cable construction, SIMPLEX sheath diameter: 2.5 mm	HITRONIC® TORSION 2G50/125 OM2	26310202	227
	HITRONIC® TORSION 4G50/125 OM2	26310204	227
	HITRONIC® TORSION 8G50/125 OM2	26310208	227
	HITRONIC® TORSION 12G50/1225 OM2	26310212	227
Fibre optical cables for wind applications with defined movement, torsion with robust PUR sheath, breakout cable construction, SIMPLEX sheath diameter: 2.5 mm	HITRONIC® TORSION 2G62.5/125 OM1	26310102	227
	HITRONIC® TORSION 4G62.5/125 OM1	26310104	227
	HITRONIC® TORSION 8G62.5/125 OM1	26310108	227
	HITRONIC® TORSION 12G62.5/125 OM1	26310112	227
Fibre optical cable for flexible applications (power chain) for high mechanical stress in industrial envoronments, PUR outer sheath, breakout cable construction, SIMPLEX sheath dimension: 2.0 mm	HITRONIC® HRM-FD1000 4G50/125 OM4	26300404	229
	HITRONIC® HRM-FD1000 4G50/125 OM3	26300304	229
	HITRONIC® HRM-FD1000 4G50/125 OM2	26300204	229
	HITRONIC® HRM-FD1000 4G62.5/125 OM1	26300104	229
	HITRONIC® HRM-FD1000 4E9/125 OS2	26300904	229
Reelable fibre optical cable for events and plant engineering, tactical applications, with robust PUR outer sheath, mini-Breakout cable construction, tight buffer fibre diameter: 900µm	HITRONIC® HDM600 4G50/125 OM4	26610404	228
	HITRONIC® HDM600 6G50/125 OM4	26610406	228
	HITRONIC® HDM700 8G50/125 OM4	26610408	228
Reelable fibre optical cable for events and plant engineering, tactical applications, with robust PUR outer sheath, mini-Breakout cable construction, tight buffer fibre diameter: 900µm	HITRONIC® HDM600 4G50/125 OM3	26610304	228
	HITRONIC® HDM600 6G50/125 OM3	26610306	228
	HITRONIC® HDM700 8G50/125 OM3	26610308	228
Reelable fibre optical cable for events and plant engineering, tactical applications, with robust PUR outer sheath, mini-Breakout cable construction, tight buffer fibre diameter: 900µm	HITRONIC® HDM600 4G50/125 OM2	26610204	228
	HITRONIC® HDM600 6G50/125 OM2	26610206	228
	HITRONIC® HDM700 8G50/125 OM2	26610208	228
Reelable fibre optical cable for events and plant engineering, tactical applications, with robust PUR outer sheath, mini-Breakout cable construction, tight buffer fibre diameter: 900µm	HITRONIC® HDM600 4G62.5/124 OM1	26610104	228
	HITRONIC® HDM600 6G62.5/125 OM1	26610106	228
	HITRONIC® HDM700 8G62.5/125 OM1	26610108	228

POF selection table [Connector – Cable – Tools – Accessories]

Connector types / Cable – tools – accessories		Article no.	ST (BFOC)		FSMA			
			Crimp version	Clamp version	Crimp version		Clamp version	
			POF Connector ST(BFOC) Crimp 2.2	POF Connector ST(BFOC) Crimp 2.2	POF Connector FSMA Crimp 2.2	POF Connector FSMA Hex Crimp	POF Connector FSMA Crimp 2.2	POF Connector FSMA Hex Clamp
			Article no./PU	Article no./PU	Article no./PU		Article no./PU	
			29125099/4	29120099/4	29135099/4	29135089/4	29130099/4	29130089/4
			29125098/50	29120098/50	29135098/50	29135088/50	29130098/50	29130088/50
(compatible) Cables	HITRONIC® POF SIMPLEX PE	28000001	X	X	X	X	X	X
	HITRONIC® POF SIMPLEX PE-PUR	28020001	X	X	X	X	X	X
	HITRONIC® POF SIMPLEX FD PE-PUR	28320001	X	X	X	X	X	X
	HITRONIC® POF DUPLEX PE	28000002	X	X	X	X	X	X
	HITRONIC® POF DUPLEX PE-PUR	28020002	X	X	X	X	X	X
	HITRONIC® POF DUPLEX HEAVY PE-PUR	28030002	X	X	X	X	X	X
	HITRONIC® POF DUPLEX PNB PA-PUR	28051002	X	X	X	X	X	X
	HITRONIC® POF DUPLEX PNB PA-PVC	28052002	X	X	X	X	X	X
	HITRONIC® POF DUPLEX FD PE-PUR	28320002	X	X	X	X	X	X
	HITRONIC® POF DUPLEX FD PNC PA-PUR	28351002	X	X	X	X	X	X
Tool sets	Assembly Set POF Connector FSMA	29500001			X	X	(X)*	(X)*
	Assembly Set POF Connector ST(BFOC)	29500002	X	(X)*				
	Assembly Set POF Connector SC/SC-RJ	29500004						
Adapters	POF Adapter FSMA/4PC	29430099			X	X	X	X
	POF Adapter FSMA Hex/4PC	29430089			X	X	X	X
	POF Adaper ST (BFOC)/4PC	29420099	X	X				
	POF Adapter F05 SIMPLEX/4PC	29450099						
	POF Adapter HFBR4505 GY SIMPLEX/4PC	29440099						
	POF Adapter HFBR4515 BL SIMPLEX/4PC	29441099						
Individual accessories, tools, supplies	POF Buffered Fibre Stripper 2.2 mm	29500011	X	X	X	X	X	X
	POF Cable Stripper 3.6/6.0 mm	29500012	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)
	POF Cable Stripper PA 2.2 mm	29500013	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)
	POF Crimp Tool 2.5/3.0/4.5/4.95 mm	29500010	X		X	X		
	Strain relief element scissors	29500017	X	X	X	X	X	X
	Polishing film graining size 1000 (BL)	29500021	X	X	X	X	X	X
	Polishing film graining size 0.3 µm (WH)	29500022						
	Polishing film graining size 1 µm (GN)	29500023	X	X	X	X	X	X
	Polishing film graining size 5 µm (BR)	29500024	X	X	X	X	X	X
	Polishing glass plate 150x230 mm	29500020	X	X	X	X	X	X
	Polishing Disc POF ST(BFOC) Connector	29500032	X	X				
	Polishing Disc POF HFBR4501/4511 SIMPLEX	29500033						
	Polishing Disc POF SIMPLEX 2.2 mm	29500036						
	Polishing Disc POF FSMA Connector	29500031			X	X	X	X
	Polishing Disc POF F05 Connector	29500035						
	Polishing Disc POF HFBR4516 DUPLEX	29500034						
	Polishing Disc POF SC Connector	29500037						
	POF Cutter 2.2/1.0 mm Guillotine	29500014	X	X	X	X	X	X
	POF BufferedFibreCutter 2.2 mm manual	29500015	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)
	POF BufferedFibreCutter 2.2 mm automatic	29500016	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)
Optional test accessories	POF Optical Transmitter (TMR)	29500070	X	X	X	X	X	X
	POF Optical TMR Adapter HFBR, 650 nm	29500071						
	POF Optical TMR Adapter FSMA, 650 nm	29500072			X	X	X	X
	POF Optical TMR Adapter ST(BFOC), 650 nm	29500073	X	X				
	POF Optical TMR Adapter F05, 660 nm	29500074						
	POF Optical TMR Adapter HFBR, 660 nm	29500075						
	POF Optical TMR Adapter FSMA, 660 nm	29500076			X	X	X	X
	POF Optical TMR Adapter ST(BFOC), 660 nm	29500077	X	X				
	POF Optical Power Meter 660/850 nm	29500080	X		X	X	X	X
	POF Power Meter Adapter HFBR4501/4521	29500081						
	POF Power Meter Adapter FSMA	29500082			X	X	X	X
	POF Power Meter Adapter ST(BFOC)	29500083	X	X				
	POF Power Meter Adapter F05	29500084						
	POF Measuring Equiment Set 660/850 nm	29500089	X (Set: Transmitter, Power Meter)	X (Set: Transmitter, Power Meter)	X (Set: Transmitter, Power Meter)	X (Set: Transmitter, Power Meter)	X (Set: Transmitter, Power Meter)	X (Set: Transmitter, Power Meter)

* Includes tools that can be used on the clamp version.

SC-RJ	F05 SIMPLEX	HFBR-Connector Family								
Crimp version										
POF Connector SC-RJ Crimp 2.2	POF Connector F05 SIMPLEX	POF Connector HFBR4501	POF Connector HFBR4503	POF Connector HFBR4506	POF Connector HFBR4511	POF Connector HFBR4513	POF Connector HFBR4516	POF Connector HFBR4531	POF Connector HFBR4532	POF Connector HFBR4533
Article no./PU	Article no./PU	Article no./PU								
29161097/1	29150099/4	29140099/4	29141099/4	29142099/4	29143099/4	29144099/4	29145099/4	29146099/4	29147099/4	29148099/4
-	29150098/50	29140098/50	29141098/50	29142098/50	29143098/50	29144098/50	29145098/50	29146098/50	29147098/50	29148098/50
	X	X	X		X	X		X	X	X
	X	X	X		X	X		X	X	X
	X	X	X		X	X		X	X	X
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X
X										
	X									
		X			X					
		X			X					
X	X	X	X	X	X	X	X	X	X	X
X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)	X (for cable)
X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)
		X	X	X	X	X	X			
X	X									
X	X		X	X	X	X	X			
X	X		X	X	X	X	X			
X	X		X	X	X	X	X			
X	X									
		X			X					
	X									
							X			
X										
X	X	X	X	X	X	X	X	X	X	X
X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)
X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)	X (Alternative)
	X	X								
		X								
	X									
		X								
	X	X								
		X								
	X									
	X (Set: Transmitter, Power Meter)	X (Set: Transmitter, Power Meter)								

PCF selection table [Connector – Cable – Tools – Accessories]

Cable – tools – accessories		Connector types / Article no.	ST (BFOC) Clamp version	
			PCF Connector ST (BFOC) Clamp 3.0	PCF Connector ST (BFOC) Clamp 2.2
			Article no./PU	
			29126799/4	29125799/4
			29126798/50	29125798/50
(compatible) Cables	HITRONIC® PCF SIMPLEX PUR, 2.9 mm	28600701	X	
	HITRONIC® PCF DUPLEX FRNC-PUR, 2.9 mm	28020702	X	
	HITRONIC® PCF DUPLEX FRNC-PE, 2.9 mm	28620702	X	
	HITRONIC® PCF DUPLEX PNB PVC-PVC A, 2.2 mm	28055702		X
	HITRONIC® PCF DUPLEX PNB PVC-PVC, 2.2 mm	28052702		X
	HITRONIC® PCF DUPLEX FD FRNC-PUR, 2.2 mm	28320702		X
	HITRONIC® PCF DUPLEX FD PNC PVC-PUR, 2.2 mm	28351702		X
	HITRONIC® PCF DUPLEX FD PNC PVC-PVC, 2.2 mm	28352702		X
Tool sets	Assembly Set PCF Connector FSMA	29500701		
	Assembly Set PCF Connector ST(BFOC)	29500702	X	X
	Assembly Set PCF Connector SC/SC-RJ	29500704		
	Assembly Set PCF Connector HFBR4521	29500703		
Adapters	POF Adapter FSMA/4PC	29430099		
	POF Adapter FSMA Hex/4PC	29430089		
	POF Adaper ST (BFOC)/4PC	29420099	X	X
	POF Adapter F05 SIMPLEX/4PC	29450099		
	POF Adapter HFBR4505 GY SIMPLEX/4PC	29440099		
	POF Adapter HFBR4515 BL SIMPLEX/4PC	29441099		
Individual accessories, tools, supplies	PCF Buffered Fibre Stripper 0.5 mm (K200/230)	29500711	X	X
	POF Cable Stripper 3.6/6.0 mm	29500012	X	X
	POF Cable Stripper PA 2.2 mm	29500013		
	POF Crimp Tool 2.5/3.0/4.5/4.95 mm	29500010		
	PCF Cleaving Tool FSMA Connector	29500712		
	PCF Cleaving Tool ST(BFOC) Connector	29500713	X	X
	PCF Cleaving Tool HFBR4521 Connector	29500714		
	PCF Cleaving Tool SC Connector	29500715		
	Strain relief element scissors	29500017	X	X
	PCF Microscope Adapter FSMA SIMPLEX	29500771		
	PCF Microscope Adapter ST(BFOC) SIMPLEX	29500772	X	X
	PCF Microscope Adapter HFBR SIMPLEX	29500773		
	PCF Inspection Microscope (100x)	29500770	X	X
	Polishing film graining size 1000 (BL)	29500021		
	Polishing film graining size 0.3 µm (WH)	29500022	X (optional)	X (optional)
	Polishing film graining size 1 µm (GN)	29500023	X (optional)	X (optional)
	Polishing film graining size 5 µm (BR)	29500024	X (optional)	X (optional)
	Polishing glass plate 150x230 mm	29500020	X (optional)	X (optional)
	Polishing Disc POF ST(BFOC) Connector	29500032	X (optional)	X (optional)
	Polishing Disc POF HFBR4501/4511 SIMPLEX	29500033		
	Polishing Disc POF SIMPLEX 2.2 mm	29500036		
	Polishing Disc POF FSMA Connector	29500031		
	Polishing Disc POF F05 Connector	29500035		
	Polishing Disc POF HFBR4516 DUPLEX	29500034		
	Polishing Disc PCF HFBR4521 Connector	29500733		
	Polishing Disc POF SC Connector	29500037		
Optional test accessories	POF Optical Transmitter (TMR)	29500070	X	X
	POF Optical TMR Adapter HFBR, 650 nm	29500071		
	POF Optical TMR Adapter FSMA, 650 nm	29500072		
	POF Optical TMR Adapter ST(BFOC), 650 nm	29500073	X	X
	POF Optical TMR Adapter F05, 660 nm	29500074		
	POF Optical TMR Adapter HFBR, 660 nm	29500075		
	POF Optical TMR Adapter FSMA, 660 nm	29500076		
	POF Optical TMR Adapter ST(BFOC), 660 nm	29500077	X	X
	POF Optical Power Meter 660/850 nm	29500080	X	X
	POF Power Meter Adapter HFBR4501/4521	29500081		
	POF Power Meter Adapter FSMA	29500082		
	POF Power Meter Adapter ST(BFOC)	29500083	X	X
	POF Power Meter Adapter F05	29500084		
	POF Measuring Equiment Set 660/850 nm	29500089	X	X

FSMA		SC-RJ		HFBR 4521	
Clamp version		Clamp version		Clamp version	Crimp version
PCF Connector FSMA Clamp 3.0	PCF Connector FSMA Clamp 2.2	PCF Connector SC-RJ Clamp 3.0	PCF Connector SC-RJ Clamp 2.2	PCF Connector HFBR4521 Clamp 3.0	PCF Connector HFBR4521 BK SIMPLEX 2.2
Article no./PU		**Article no./PU**		**Article no./PU**	
29136799/4	29135799/4	29166797/1	29165797/1	29141799/4	29140799/4
29136798/50	29135798/50	–	–	29141798/50	29140798/50
X		X		X	
X		X		X	
X		X		X	
	X		X		
	X		X		
	X		X		X
	X		X		X
	X		X		X
X	X				
		X	X		
				X	
X	X				
X	X				
X	X	X	X	X	X
X	X	X	X	X	X
X	X				
				X	
		X	X		
X	X			X	X
X	X				
				X	X
X	X			X	X
X (optional)	X (optional)	X (optional)	X (optional)	X (optional)	X
X (optional)	X (optional)	X (optional)	X (optional)	X (optional)	X
X (optional)	X (optional)	X (optional)	X (optional)	X (optional)	X
X (optional)	X (optional)	X (optional)	X (optional)	X (optional)	X
X (optional)	X (optional)				
				X (optional)	X
		X (optional)	X (optional)		
X	X			X	X
X	X				
				X	X
X	X				
X	X			X	X
				X	X
X	X				
X	X			X	X

Quickfinder [GOF DUPLEX Patchcord]

Duplex Patchcord	GOF Connector		ST					SC		
		Length (m)	G 50 OM4	G50 OM3	G50 OM2	G62.5 OM1	OS2	G 50 OM4	G50 OM3	G50 OM2
	ST	1	29022401	29022301	29022201	*	29022901	29021401	29021301	29021201
		2	29022402	29022302	29022202	29022102	29022902	29021402	29021302	29021202
		3	29022403	29022303	29022203	29022103	29022903	29021403	29021303	29021203
		5	29022405	29022305	29022205	*	29022905	29021405	29021305	29021205
		10	29022410	29022310	29022210	*	29022910	29021410	29021310	29021210
		15	*	*	*	*	*	29021415	*	*
		20	*	*	*	*	*	29021420	*	*
	SC	1	*	*	*	*	*	29011401	29011301	29011201
		2	*	*	*	*	*	29011402	29011302	29011202
		3	*	*	*	*	*	29011403	29011303	29011203
		5	*	*	*	*	*	29011405	29011305	29011205
		10	*	*	*	*	*	29011410	29011310	29011210
	LC	1	29032401	29032301	29032201	*	29032901	29031401	29031301	29031201
		2	29032402	29032302	29032202	29032102	29032902	29031402	29031302	29031202
		3	29032403	29032303	29032203	29032103	29032903	29031403	29031303	29031203
		5	29032405	29032305	29032205	29032105	29032905	29031405	29031305	29031205
		10	29032410	29032310	29032210	29032110	29032910	29031410	29031310	29031210
		15	*	*	*	*	*	*	*	*
		20	*	*	*	*	*	*	*	*
	FC	1	*	*	*	*	*	*	*	*
		2	*	*	*	*	*	*	*	*
		3	*	*	*	*	*	*	*	*
		5	*	*	*	*	*	*	*	*
		10	*	*	*	*	*	*	*	*

Legend

Standard catalog article

Also longer variants possible upon request!

*Upon request.

		LC					FC					
G62.5 OM1	OS2	G 50 OM4	G50 OM3	G50 OM2	G62.5 OM1	OS2	G 50 OM4	G50 OM3	G50 OM2	G62.5 OM1	OS2	Page
29021101	29021901	*	*	*	*	*	*	*	*	*	*	242
29021102	29021902	*	*	*	*	*	*	*	*	*	*	242
29021103	29021903	*	*	*	*	*	*	*	*	*	*	242
29021105	29021905	*	*	*	*	*	*	*	*	*	*	242
29021110	29021910	*	*	*	*	*	*	*	*	*	*	242
*	*	*	*	*	*	*	*	*	*	*	*	242
29021120	*	*	*	*	*	*	*	*	*	*	*	242
*	29011901	*	*	*	*	*	*	*	*	*	*	242
29011102	29011902	*	*	*	*	*	*	*	*	*	*	242
*	29011903	*	*	*	*	*	*	*	*	*	*	242
*	29011905	*	*	*	*	*	*	*	*	*	*	242
*	29011910	*	*	*	*	*	*	*	*	*	*	242
	29031901	29033401	29033301	29033201	29033101	29033901	*	*	*	*	*	242
29031102	29031902	29033402	29033302	29033202	29033102	29033902	*	*	*	*	*	242
29031103	29031903	29033403	29033303	29033203	29033103	29033903	*	*	*	*	*	242
*	29031905	29033405	29033305	29033205	29033105	29033905	*	*	*	*	*	242
*	29031910	29033410	29033310	29033210	29033110	29033910	*	*	*	*	*	242
*	*	*	29033315	*	*	*	*	*	*	*	*	242
*	*	*	*	*	*	29033920	*	*	*	*	*	242
*	*	*	*	*	*	*	29044401	29044301	29044201	*	29044901	242
*	*	*	*	*	*	*	29044402	29044302	29044202	29044102	29044902*	242
*	*	*	*	*	*	*	29044403	29044303	29044203	*	29044903	242
*	*	*	*	*	*	*	29044405	29044305	29044205	*	29044905	242
*	*	*	*	*	*	*	29044410	29044310	29044210	*	29044910	242

HITRONIC® POF SIMPLEX BUFFERED FIBRE

Polymer optical fibre as simplex buffered fibre version with PE sheath

Info

- Suitable for direct connector assembly

Benefits

- Transmission lengths up to 70 m
- Suitable for direct connector assembly
- Easy to handle
- No crosstalk
- EMC protection

Application range

- For optical signal transmission in industrial applications
- Very suitable for fixed installation in control cabinets, cable ducts, or pipes with low mechanical stress

Product features

- Lightweight
- High flexibility
- Halogen-free buffer tube

Product Make-up

- Polymer Optical Fibre (POF)
- PE buffer tube
- Without outer sheath
- Colour: black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Buffered fibre: 2.2 mm

Fibre type
POF - P980/1000

Standard designation
J-V2Y

Optical fibre type
Core material: PMMA
Cladding material: fluoropolymers

Permissible bending radius
≥ 10 x outer diameter

Permissible tensile force
Fixed installation: 5 N
Short-term: 15 N

Temperature range
Operation: -55°C to +85°C
Installation: -10°C to +50°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
HITRONIC® POF SIMPLEX PE					
28000001	HITRONIC® POF SIMPLEX PE	980/1000 POF	1	2.2	3.8

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- HITRONIC® POF SIMPLEX CABLE refer to page 209

Accessories

- POF Connector and Adapter HFBR refer to page 213
- POF Cutting Tools refer to page 216
- POF Connector F05 Simplex refer to page 214
- UNIVERSAL STRIP stripping tool refer to main catalogue 2018/19
- Ty-Grip® FOL / FO Cable tie refer to main catalogue 2018/19

HITRONIC® POF SIMPLEX CABLE

Polymer optical fibre as simplex fibre cable version with PUR sheath for fixed or flexible application

Info

- Suitable for direct connector assembly

Benefits

- Optical data transmisson up to 70m
- Easy to handle
- No intereference by external fields
- No grounding problems
- Suitable for direct connector assembly

Application range

- For optical signal transmission in industrial applications
- As a link between moving parts
- FD cable version:
  for flexible applications (power chains)

Product features

- Resistant to abrasion, oil, microbes and hydrolysis
- Adhesion-free
- Outer sheath flame-retardant and halogen-free
- FD cable version:
  5.000.000 bending cycles

Product Make-up

- Polymer Optical Fibre (POF)
- PE buffer tube
- Aramid yarns as strain relief
- PUR outer sheath
- Colour: orange (RAL 2003)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description:
Fibre optic cable

Dimensions
Buffered fibre: 2.2 mm
Cable: see table

Fibre type
POF - P980/1000

Standard designation
J-V2Y(ZN)11Y

Optical fibre type
Core material: PMMA
Cladding material: fluoropolymers

Permissible bending radius
≥ 10 x outer diameter

Permissible tensile force
Fixed installation: 100 N
Short-term: 600 N

Temperature range
Operation: -20 °C to +70 °C
Installation: -10°C to +50°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
HITRONIC® POF SIMPLEX PE-PUR					
28020001	HITRONIC® POF SIMPLEX PE-PUR	980/1000 POF	1	5.5	25
HITRONIC® POF SIMPLEX FD PE-PUR for draig chain application					
28320001	HITRONIC® POF SIMPLEX FD PE-PUR	980/1000 POF	1	6	30

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- POF Assembly Sets refer to page 216
- POF Cutting Tools refer to page 216
- POF Connector F-SMA and ST(BFOC) refer to page 214
- UNIVERSAL STRIP stripping tool refer to main catalogue 2018/19
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® POF DUPLEX BUFFERED FIBRES

Polymer optical fibre as duplex buffered fibres version with PE sheath

Info

- For direct connector assembly

Benefits

- Transmission lengths up to 70 m
- Suitable for direct connector assembly
- Easy to handle
- No crosstalk
- EMC protection

Application range

- For optical signal transmission in industrial applications
- Very suitable for fixed installation in control cabinets, cable ducts, or pipes with low mechanical stress
- Light mechanical stress
- Identification by white dots

Product features

- Halogen-free
- Lightweight
- High flexibility

Product Make-up

- Polymer Optical Fibre (POF)
- Twin cable
- PE buffer tube
- Without outer sheath
- Colour: black

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Twin cable
2x2.2mm

Core identification code
Black/black with white dots

Fibre type
POF - P980/1000

Standard designation
J-V2Y

Optical fibre type
Core material: PMMA
Cladding material: fluoropolymers

Permissible bending radius
≥ 10 x outer diameter

Permissible tensile force
Fixed installation: 10 N
Short-term: 30 N

Temperature range
Operation: -55 °C to +85 °C
Installation: -10 °C to +50 °C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
HITRONIC® POF DUPLEX BUFFERED FIBRES					
28000002	HITRONIC® POF DUPLEX PE	980/1000 POF	2	2.2	7.6

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- HITRONIC® POF SIMPLEX BUFFERED FIBRE refer to page 208
- HITRONIC® POF DUPLEX CABLE refer to page 211
- HITRONIC® POF cables for PROFINET Applications refer to page 212

Accessories

- POF Connector and Adapter HFBR refer to page 213
- POF Cutting Tools refer to page 216
- POF Connector F-SMA and ST(BFOC) refer to page 214
- UNIVERSAL STRIP stripping tool refer to main catalogue 2018/19
- Ty-Grip® FOL / FO Cable tie refer to main catalogue 2018/19

EtherNet/IP

HITRONIC® POF DUPLEX CABLE

Polymer optical fibre as duplex fibre cable version with PUR sheath for fixed or flexible application

Info

- For direct connector assembly

Benefits

- Optical data transmisson up to 70m
- Easy to handle
- No intereference by external fields
- No grounding problems
- Suitable for direct connector assembly

Application range

- For optical signal transmission in industrial applications
- FD cable version: for flexible applications (power chains)

Product features

- Outer sheath flame-retardant and halogen-free
- Resistant to abrasion, oil, microbes and hydrolysis
- Adhesion-free
- FD cable version: 5.000.000 bending cycles

Product Make-up

- Polymer Optical Fibre (POF)
- PE buffer tube
- Fibre colour coding: black, orange
- Aramid yarns as strain relief
- PUR outer sheath, orange (RAL 2003)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Buffered fibre: 2.2 mm
Cable: see table

Core identification code
Black, orange

Fibre type
2x
POF - P980/1000

Standard designation
J-V2Y(ZN)11Y

Optical fibre type
Core material: PMMA
Cladding material: fluoropolymers

Permissible bending radius
≥ 10 x outer diameter

Permissible tensile force
Fixed installation: 100 N (PE-PUR), 130 N (Heavy PE-PUR)
Short-term: 400 N

Temperature range
Operation: -40°C to +7 °C (FD: -20°C to +70°C)
Installation: -10°C to +50°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
HITRONIC® POF DUPLEX PE-PUR					
28020002	HITRONIC® POF DUPLEX PE-PUR	980/1000 POF	2	5.5	27
HITRONIC® POF DUPLEX HEAVY PE-PUR					
28030002	HITRONIC® POF DUPLEX HEAVY PE-PUR	980/1000 POF	2	8	57
HITRONIC® POF DUPLEX FD PE-PUR for draig chain application					
28320002	HITRONIC® POF DUPLEX FD PE-PUR	980/1000 POF	2	6	30

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

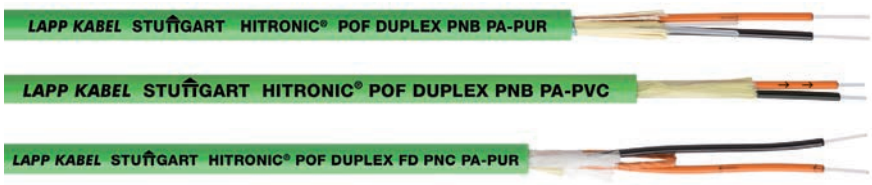
- HITRONIC® POF SIMPLEX CABLE refer to page 209
- HITRONIC® POF cables for PROFINET Applications refer to page 212

Accessories

- POF Assembly Sets refer to page 216
- POF Cutting Tools refer to page 216
- POF Connector F-SMA and ST(BFOC) refer to page 214
- POF Connector SC-RJ refer to page 215
- UNIVERSAL STRIP stripping tool refer to main catalogue 2018/19
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® POF cables for PROFINET Applications

Polymer optical fibre as duplex fibre cable version with PUR sheath for PROFINET applications type B or C



Info

- PROFINET compliant
  - Type B or Type C

Benefits

- Optical data transmisson up to 70m
- Easy to handle
- No intereference by external fields
- No grounding problems
- Suitable for direct connector assembly

Application range

- For optical signal transmission in industrial applications
- PROFINET / Industrial Ethernet
- At 100 Mbit/s: max 50 m cable length
- PROFINET type B: for fixed laying
- PROFINET type C: for flexible applications (power chains)

Product features

- Cable version with PVC outer sheath: for standard applications in industrial environments
- Cable version with PUR outer sheath: for high mechanical or chemical stress in industrial environments and resistant to oil
- PNB - PROFINET-Type B
- PNC - PROFINET-Type C
- FD - Highly flexible (power chains)

Product Make-up

- Polymer Optical Fibre (POF)
- PA buffer tube
- Fibre colour coding: black, orange (with arrow printing)
- Aramid yarns as strain relief
- Outer sheath material PUR or PVC (see article description)
- Outer sheath colour: green (RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Buffered fibre: 2.2 mm
Cable: see table

Core identification code
Black, orange (with arrow printing)

Standard designation
J-V4Y(ZN)11Y 2P980/1000
J-V4Y(ZN)Y 2P980/1000
J-V4Y(ZN)11Y 2P980/1000 flex

Optical fibre type
Core material: PMMA
Cladding material: fluoropolymers

Permissible bending radius
≥ 10 x outer diameter

Permissible tensile force
see data sheet

Temperature range
Operation: -20 °C to +70 °C
Installation: -10°C to +50°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
POF DUPLEX - PROFINET TYPE B					
28051002	HITRONIC® POF DUPLEX PNB PA-PUR	980/1000 POF	2	8	56
28052002	HITRONIC® POF DUPLEX PNB PA-PVC	980/1000 POF	2	7.8	59
POF DUPLEX - PROFINET TYPE C					
28351002	HITRONIC® POF DUPLEX FD PNC PA-PUR	980/1000 POF	2	8	55

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- POF Assembly Sets refer to page 216
- POF Cutting Tools refer to page 216
- POF Connector F-SMA and ST(BFOC) refer to page 214
- POF Connector SC-RJ refer to page 215
- EPIC® DATA PB Sub-D FO refer to page 71
- UNIVERSAL STRIP stripping tool refer to main catalogue 2018/19
- STAR STRIP stripping tool refer to main catalogue 2018/19

POF Connector and Adapter HFBR

Connectors for polymer optical fibre cables, connectors and adapters type HFBR family (HFBR4501/4503/4506/4511/4513/4516/4531/4532/4533)

Benefits

- Compatible with HP Versatile Link Connectors and Components series
- Different colours for channel coding

Application range

- Factory automation
- Medical equipment
- Telecommunications Switching Systems
- Automotive Networks
- Printed Circuit Board

Product features

- HFBR connector series for 2.2 mm POF
- For crimping or clamping
- Simplex or Duplex variations

Technical data

ETIM

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

HFBR 4501

HFBR 4503

HFBR-4531

HFBR 4516

Article number	Article designation	Pieces / PU
Connector HFBR-4501, Simplex, with Crimp Sleve		
29140099	POF Connector HFBR4501 GY Simplex /4PC	4
29140098	POF Connector HFBR4501 GY Simplex /50PC	50
Latching Connector HFBR-4503, Simplex, with Crimp Sleve		
29141099	POF Connector HFBR4503 GY Simplex /4PC	4
29141098	POF Connector HFBR4503 GY Simplex /50PC	50
Connector HFBR-4506, Duplex, with Crimp Sleve		
29142099	POF Connector HFBR4506 WH Duplex /4PC	4
29142098	POF Connector HFBR4506 WH Duplex /50PC	50
Connector HFBR-4511, Simplex, with Crimp Sleve		
29143099	POF Connector HFBR4511 BL Simplex /4PC	4
29143098	POF Connector HFBR4511 BL Simplex /50PC	50
Latching Connector HFBR-4513, Simplex, with Crimp Sleve		
29144099	POF Connector HFBR4513 BL Simplex /4PC	4
29144098	POF Connector HFBR4513 BL Simplex /50PC	50
Latching Connector HFBR-4516, Duplex, with Crimp Sleve		
29145099	POF Connector HFBR4516 GY Duplex /4PC	4
29145098	POF Connector HFBR4516 GY Duplex /50PC	50
Clamp Connector HFBR-4531, Simplex		
29146099	POF Connector HFBR4531 BK Simplex /4PC	4
29146098	POF Connector HFBR4531 BK Simplex /50PC	50
Clamp and Latching Connector HFBR-4532, Simplex		
29147099	POF Connector HFBR4532 BK Simplex /4PC	4
29147098	POF Connector HFBR4532 BK Simplex /50PC	50
Clamp Connector HFBR-4533, Simplex		
29148099	POF Connector HFBR4533 BL Simplex /4PC	4
29148098	POF Connector HFBR4533 BL Simplex /50PC	50
HFBR4505 Adapters		
29440099	POF Adapter HFBR4505 GY Simplex /4PC	4
HFBR4515 Adapters		
29441099	POF Adapter HFBR4515 BL Simplex /4PC	4

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- POF Cutting Tools refer to page 216
- POF Polishing tools and accessories refer to page 217

POF Connector F05 Simplex

Connectors for polymer optical fibre cables, connector and adapter type F05, compatible with TOCP155K

Benefits

- Easy to assemble

Application range

- Digital audio
- Factory automation
- Office Automation (Smart House)

Product features

- F-05 (TOCP) SIMPLEX clamp connector for connecting to polymer optical fibre without crimping or gluing
- Snap-In Connector
- Suitable for 2.2 mm POF

Info

- Compatible with TOCP155K

Technical data

ETIM **Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

Article number	Article designation	Pieces / PU
Connector F05 Simplex		
29150099	POF Connector F05 Simplex /4PC	4
29150098	POF Connector F05 Simplex /50PC	50
Adapter for Connector F05 Simplex		
29450099	POF Adapter F05 Simplex /4PC	4

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- POF Cutting Tools refer to page 216
- POF Polishing tools and accessories refer to page 217

POF Connector F-SMA and ST(BFOC)

Connectors for polymer optical fibre cables, connector type FSMA and ST(BFOC)

Benefits

- As crimp or clamp version for easy assembling

Product features

- FSMA and ST(BFOC) connector with knurled nut or hexagonal nut for crimping, gluing or easy clamping
- Suitable for 2.2 mm POF
- Available for different cable diameters (2.2 mm and 6.0 mm)
- Connector including bend protection boot and dust cap

Info

- FSMA and ST(BFOC) connectors for POF cable assembly

Technical data

ETIM **Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

Article number	Article designation	Boot colour	Pieces / PU
FSMA Connectors with knurled nut for crimping			
29135099	POF Connector FSMA Crimp 2.2 /4PC	2 black, 2 red	4
29135098	POF Connector FSMA Crimp 2.2 /50PC	25 black, 25 red	50
29137099	POF Connector FSMA Crimp 6.0 /4PC	black	4
29137098	POF Connector FSMA Crimp 6.0 /50PC	black	50
FSMA Connectors with hexagonal nut for crimping			
29135089	POF Connector FSMA Hex Crimp 2.2 /4PC	2 black, 2 red	4
29135088	POF Connector FSMA Hex Crimp 2.2 /50PC	25 black, 25 red	50
29132089	POF Connector FSMA Hex Crimp 6.0 /4PC	black	4
29132088	POF Connector FSMA Hex Crimp 6.0 /50PC	black	50
FSMA Connectors with knurled nut for clamping			
29130099	POF Connector FSMA Clamp 2.2 /4PC	2 black, 2 red	4
29130098	POF Connector FSMA Clamp 2.2 /50PC	25 black, 25 red	50
FSMA Connectors with hexagonal nut for clamping			
29130089	POF Connector FSMA Hex Clamp 2.2 /4PC	2 black, 2 red	4
29130088	POF Connector FSMA Hex Clamp 2.2 /50PC	25 black, 25 red	50
ST(BFOC) Connectors for crimping			
29125099	POF Connector ST(BFOC) Crimp 2.2 /4PC	2 black, 2 red	4
29125098	POF Connector ST(BFOC) Crimp 2.2 /50PC	25 black, 25 red	50
ST(BFOC) Connectors for clamping			
29120099	POF Connector ST(BFOC) Clamp 2.2 /4PC	2 black, 2 red	4
29120098	POF Connector ST(BFOC) Clamp 2.2 /50PC	25 black, 25 red	50

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- POF Assembly Sets refer to page 216
- POF Cutting Tools refer to page 216
- POF Polishing tools and accessories refer to page 217
- POF Measurement Equipment refer to page 218

POF Connector SC-RJ

Connector for polymer optical fibre cables, connector type SC-RJ

Benefits

- Connectors for PROFINET Data Cabling
- As crimp version for easy assembling

Product features

- Connector set included two SC connectors, SC-RJ housing, two bending protection boots, dust caps
- Suitable for 2.2 mm POF
- Bend protection boot colour: black and red

Info

- SC-RJ connectors for POF cable assembly
- Connectors for PROFINET Data Cabling

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

Certifications
SC-RJ complies with IEC61754-24

Article number	Article designation	Pieces / PU
POF Connector SC-RJ		
29161097	POF Connector SC-RJ Crimp 2.2	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- POF Assembly Sets refer to page 216
- POF Cutting Tools refer to page 216
- POF Polishing tools and accessories refer to page 217
- POF Measurement Equipment refer to page 218

POF Adapter F-SMA

Adapter for connector type FSMA

Product features

- POF Adapter FSMA: version with two fixing nuts and lock wahser
- POF Adapter FSMA hexa: version with hexagonal flange, fixing nuts and lock wahser

Info

- Can be used for POF and PCF connector types

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000752
ETIM 5.0/6.0 Class-Description: Fibre optic coupler

Article number	Article designation	Pieces / PU
FSMA Adapters		
29430099	POF Adapter FSMA /4PC	4
29430089	POF Adapter FSMA Hex /4PC	4

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

POF Adapter ST (BFOC)

Adapter for connector type ST(BFOC)

Product features

- ST(BFOC) adapter with flange, fixing nuts and lock washer

Norm references / Approvals

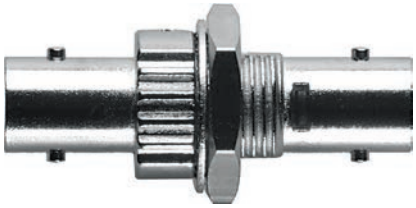
- ST comply with IEC standard 61754-2

Info

- Can be used for POF and PCF connector types

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000752
ETIM 5.0/6.0 Class-Description: Fibre optic coupler



Article number	Article designation	Pieces / PU
ST(BFOC) Adaptera		
29420099	POF Adapter ST (BFOC) /4PC	4

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

POF Assembly Sets

Assembly set for connector assembly of POF crimp connector versions: FSMA; ST(BFOC); SC/SC-RJ

Benefits

- Easy to handle
- Set includes all the necessary tools for connector assembly
- Suitable for on-site assembly

Product features

- Sets available for POF connector types FSMA and ST (BFOC) and SC / SC-RJ
- Contents: crimp tool, buffered fibre stripper, polishing disc FSMA, polishing film, cutter

Technical data

ETIM
Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002609
ETIM 5.0/6.0 Class-Description: Accessories for optic fi bre technique

Article number	Article designation	Pieces / PU
Assembly Set for POF FSMA Connector		
29500001	Assembly Set POF Connector FSMA	1
Assembly Set for POF ST(BFOC) Connector		
29500002	Assembly Set POF Connector ST(BFOC)	1
Assembly Set for POF SC/SC-RJ Connector		
29500004	Assembly Set for POF Connector SC	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

POF Cutting Tools

Cutting, stripping and crimping tools for different jacket materials and cable diameter of POF cable and connectors

Cutter Guillotine

Buffered Fibre Cutter Manual

Buffered Fibre Stripper 2.2 mm

Cable Stripper PA 2.2 mm

Strain relief element scissors

Crimp Tool

Technical data

ETIM
Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001126
ETIM 5.0/6.0 Class-Description: Fibre optic cleaver

Benefits

- Cutting tools for the POF cable and connector product range

Application range

- Cable stripper for different jacket materials and cable diameter

Product features

- Various tools for cutting buffered fibres (2.2mm) from very simple to version with automatic blade advance
- 29500011 - fibre stripper for PE buffer tube 2.2mm
- 29500013 - fibre stripper for PA buffer tube 2.2mm-2.3mm
- 29500012 - jacket stripper for cable diameter 3.6mm and 6.0mm
- Crimping tool suitable for the POF(PCF) connector program

Article number	Article designation	Pieces / PU
POF Bare Fibre Cutter		
29500014	POF Cutter 2.2/1.0mm Guillotine	5
29500015	POF BufferedFibreCutter 2.2mm manuel	1
29500016	POF BufferedFibreCutter 2.2mm automatic	1
POF Cable Stripper		
29500011	POF Buffered Fibre Stripper 2.2 mm (P980/1000)	1
29500013	POF Cable Stripper PA 2.2mm	1
29500012	POF Cable Stripper 3.6/6.0mm	1
Strain relief element scissors		
29500017	Strain relief element scissors	1
POF Crimping Tool		
29500010	POF Crimp Tool 2.5/3.0/4.5/4.95mm	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- POF Assembly Sets refer to page 216

POF Polishing tools and accessories

Polishing discs for different connector designs; polishing sheets; accessories

Benefits

- Easy to handle
- Suitable to POF Connector Assembly Sets

Product features

- Accessories for POF Assembly
- Polishing disc for various POF connector types
- Other versions are available upon request
- Polishing film with different graining size types for fibre end face treatment
- Polishing process:
  POF - Polishing Film 1000 (BU)
  Polishing Film 5µm (BN)
  Polishing Film 1µm (GN)
  PCF - Polishing Film 5 µm (BN)
  Polishing Film 1 µm (GN)
  Polishing Film 0.3 µm (WH)

Technical data

ETIM **Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC001126
ETIM 5.0/6.0 Class-Description: Fibre optic cleaver

for FSMA connector

for ST(BFOC) connector

Polishing films

Article number	Article designation	Pieces / PU
Polishing Disc for POF connector assembly		
29500031	Polishing Disc POF FSMA Connector	1
29500032	Polishing Disc POF ST(BFOC) Connector	1
29500033	Polishing Disc POF HFBR4501/4511 SIMPLEX	1
29500034	Polishing Disc POF HFBR4516 DUPLEX	1
29500035	Polishing Disc POF F05 Connector	1
29500036	Polishing Disc POF Simplex 2.2mm	1
29500733	Polishing Disc PCF HFBR4521 Connector	1
29500037	Polishing Disc POF SC Connector	1
Polishing film		
29500021	Polishing film graining size 1000 (BL)	10
29500024	Polishing film graining size 5 µm (BR)	10
29500023	Polishing film graining size 1 µm (GN)	10
29500022	Polishing film graining size 0.3 µm (WH)	10
Polishing accessories		
29500020	Polishing glass plate 150x230mm	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- POF Assembly Sets refer to page 216

POF Measurement Equipment

Measuring equipment set for wavelength range 660 nm and 850 nm; suitable for measuring assembled POF and PCF systems

Optical Power Meter

POF Measuring equipment set

Adapter for TMR / Power meter

Benefits

- Measuring Equiment Set for wavelenghts 660/850nm
- Suitable for the measurement of assemblied POF and PCF systems

Product features

- The mesasurement device is supplied without adaters. Please order separatly
- Optical Transmitter (TMR): wavelength dependent on interchangeable adapter
  - 650nm
  - 660nm
  - 850nm (on request)
- Optical Power Meter: for attenuation measurement of an assembled POF (PCF) systems adapted to Optical Transmitter (TMR)

Product Make-up

- Optical Transmitter with digital display, wavelength dependent on adapter, active interchangeable adapters are not included, please order separately
- Optical Power Meter with digital display, wavelength meter 660/850 nm, interchangeable adapters (receiver side) are not included, please order separately
- Measuring Set (29500089): Optical Transmitter and Power Meter as set in a black suitcase, interchangeable adapters are not included

Technical data

ETIM

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC002609
ETIM 5.0/6.0 Class-Description: Accessories for optic fi bre technique

Article number	Article designation	Pieces / PU
POF Measurement Equipment		
29500070	POF Optical Transmitter (TMR)	1
POF TMR Adapter, wavelength 650nm		
29500071	POF Optical TMR Adapter HFBR, 650nm	1
29500072	POF Optical TMR Adapter FSMA, 650nm	1
29500073	POF Optical TMR Adapter ST(BFOC), 650nm	1
POF TMR Adapter, wavelength 660nm		
29500074	POF Optical TMR Adapter F05, 660nm	1
29500075	POF Optical TMR Adapter HFBR, 660nm	1
29500076	POF Optical TMR Adapter FSMA, 660nm	1
29500077	POF Optical TMR Adapter ST(BFOC), 660nm	1
POF Optical Power Meter 660/850 nm		
29500080	POF Optical Power Meter 660/850 nm	1
POF Power Meter Adapters		
29500081	POF Power Meter Adapter HFBR4501/4521	1
29500082	POF Power Meter Adapter FSMA	1
29500083	POF Power Meter Adapter ST(BFOC)	1
29500084	POF Power Meter Adapter F05	1
POF Measuring Equiment Set without adapters		
29500089	POF Measuring Equiment Set 660/850nm	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

HITRONIC® PCF SIMPLEX Cable

Polymer Cladded Fibre as simplex fibre cable version for indoor or outdoor use, pur outer sheath; halogen-free

Info

- For direct connector assembly

Benefits

- Transmission lengths up to 500 m
- Suitable for direct connector assembly
- High mechanical strength
- UV-resistant
- EMC protection

Application range

- For data transmission in field bus systems, such as PROFIBUS, INTERBUS etc.
- Industrial environments

Product features

- Possible transmission wavelengths: 650 nm and 850 nm
- Outer sheath flame-retardant and halogen-free

Product Make-up

- Tight-buffered fibres
- Aramid yarns as strain relief
- PUR outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
2.9mm

Fibre type
PCF - K200/230
PCF - Polymer Cladded Fibre

Minimum bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Standard designation
A-V(ZN)11Y

Optical fibre type
Core material: glass
Cladding material: fluoropolymers

Permissible tensile force
Fixed installation: 200 N

Temperature range
Operation: -10°C to +60°C
Installation: -10°C to +50°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
HITRONIC® PCF SIMPLEX Cable					
28600701	HITRONIC® PCF SIMPLEX PUR Outdoor	200/230 PCF	1	2.9	7.5

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- PCF Assembly Sets refer to main catalogue 2018/19
- PCF Connector HFBR refer to page 223
- PCF Connector F-SMA and ST(BFOC) refer to page 223
- PCF Cutting Tools refer to page 225

HITRONIC® PCF DUPLEX Cable

Polymer Cladded Fibre as duplex fibre cable version for indoor or outdoor use

Info

- For direct connector assembly

Benefits

- Transmission lengths up to 500 m
- Suitable for direct connector assembly
- Good resistance to oil, petrol, acids and alkalis
- High mechanical strength
- EMC protection

Application range

- For data transmission in field bus systems, such as PROFIBUS, INTERBUS etc.
- Industrial environments

Product features

- Possible transmission wavelengths: 650 nm and 850 nm
- Complies with requirements for all BUS systems
- Halogen-free outer sheath

Product Make-up

- Colour-coded, tight-buffered PCF sub-cable with FRNC sheath (2.9mm)
- Aramid yarns as strain relief
- PUR outer sheath (indoor); PE outer sheath (outdoor)
- Colour: orange (indoor); black (outdoor)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Buffered fibre: 0.5mm
Single cable: 2.9 mm
Cable: see table

Core identification code
red, green

Fibre type
PCF - K200/230
PCF - Polymer Cladded Fibre

Minimum bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Standard designation
PCF DUPLEX Indoor: J-V(ZN)H11Y 2K200/230
PCF DUPLEX Outdoor: A-VQ(ZN)HB2Y 2K200/230

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: fluoropolymers

Permissible tensile force
Fixed installation: 400 N (indoor); 500 N (outdoor)
Short-term: 1200 N (indoor); 1500 N (outdoor)

Temperature range
Operation: -20 °C to +70 °C
Installation: -10°C to +50°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Indoor					
28020702	HITRONIC® PCF DUPLEX FRNC-PUR Indoor	200/230 PCF	2	8	53
Outdoor					
28620702	HITRONIC® PCF DUPLEX FRNC-PE Outdoor	200/230 PCF	2	10.5	89

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- HITRONIC® PCF DUPLEX FD cables refer to page 221
- HITRONIC® PCF cables for PROFINET Applications refer to page 222

Accessories

- PCF Assembly Sets refer to main catalogue 2018/19
- PCF Connector HFBR refer to page 223
- PCF Connector F-SMA and ST(BFOC) refer to page 223
- PCF Connector SC-RJ refer to page 224
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® PCF DUPLEX FD cables

Polymer Cladded Fibre as duplex fibre cable version for flexible applications, PUR outer sheath, halogen-free

Info

- Flexible PCF cable compatible with all BUS systems

Benefits

- Designed for use in power chains
- Transmission lengths up to 500 m
- Suitable for direct connector assembly
- Good resistance to oil, petrol, acids and alkalis
- EMC protection

Application range

- For highly flexible applications
- For data transmission in field bus systems, such as PROFIBUS, INTERBUS etc.
- As a link between moving parts
- Industrial environments

Product features

- Possible transmission wavelengths: 650 nm and 850 nm
- Complies with requirements for all BUS systems
- Outer sheath flame-retardant and halogen-free

Product Make-up

- Colour-coded, tight-buffered PCF sub-cable with FRNC sheath
- Sub cable outer diameter: 2.2mm
- Aramid yarns as strain relief
- PUR outer sheath
- Colour: orange (RAL 2003)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Buffered fibre: 0.5mm
Single cable: 2.2 mm
Cable: 8.8mm

Core identification code
red, green

Fibre type
PCF - K200/230
PCF - Polymer Cladded Fibre

Minimum bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Standard designation
A/J-V(ZN)H11Y

Optical fibre type
Core material: glass
Cladding material: fluoropolymers

Permissible tensile force
Fixed installation: 800 N
Short-term: 2000 N

Temperature range
Operation: -20 °C to +70 °C
Installation: -10°C to +50°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
HITRONIC® PCF DUPLEX FD cables					
28320702	HITRONIC® PCF DUPLEX FD FRNC-PUR	200/230 PCF	2	8.8	63

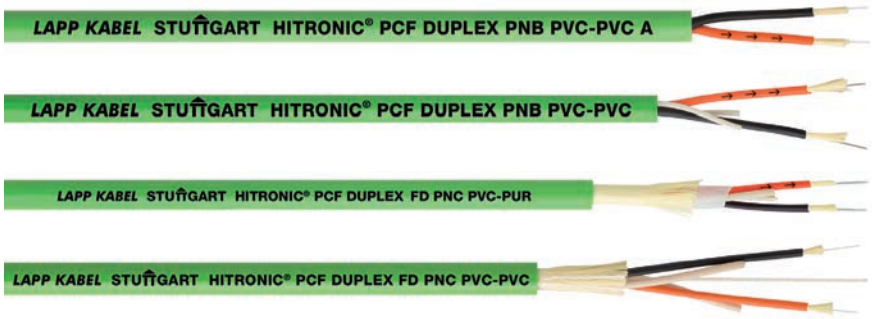
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- PCF Assembly Sets refer to main catalogue 2018/19
- PCF Connector HFBR refer to page 223
- PCF Connector F-SMA and ST(BFOC) refer to page 223
- PCF Cutting Tools refer to page 225
- PCF Connector SC-RJ refer to page 224
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® PCF cables for PROFINET Applications

Polymer optical fibre as duplex fibre cable version with PCV or PUR sheath for PROFINET applications type B or C



Info

- PROFINET compliant
  - Type B or Type C
- For direct connector assembly

Benefits

- Optical data transmisson up to 500m
- Easy to handle
- No intereference by external fields
- No grounding problems
- Suitable for direct connector assembly

Application range

- PCF DUPLEX cabels for optical signal transmission in industrial applications
- PROFINET / Industrial Ethernet
- At 100 Mbit/s: max 100 m cable length
- PROFINET type B:
  for fixed laying
- PROFINET type C:
  for flexible applications (power chains)

Product features

- Cable version with PVC outer sheath:
  for standard applications in industrial environments
- Cable version with PUR outer sheath:
  for high mechanical or chemical stress in industrial environments and resistant to oil
- PNB - PROFINET-Type B
- PNC - PROFINET-Type C
- FD - Highly flexible (power chains)

Norm references / Approvals

- 28055702: with c(UL)us certification (OFNG 75°C)

Product Make-up

- Colour-coded, tight-buffered PCF sub-cable with PVC sheath
- Sub cable outer diameter: 2.2mm
- Aramid yarns as strain relief
- Outer sheath material PUR or PVC (see article description)
- Outer sheath colour: green (RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description:
Fibre optic cable

Dimensions
Buffered fibre: 0.5mm
Single cable: 2.2 mm
Cable: see table

Core identification code
Black, orange (with arrow printing)

Fibre type
PCF - K200/230
PCF - Polymer Cladded Fibre

Minimum bending radius
see data sheet

Standard designation
J-V(ZN)YY 2K200/230
J-V(ZN)Y(ZN)11Y 2K200/230 flex
J-V(ZN)Y(ZN)Y 2K200/230 flex

Optical fibre type
Core material: glass
Cladding material: fluoropolymers

Permissible tensile force
see data sheet

Temperature range
See data sheet

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
PCF DUPLEX - PROFINET TYPE B					
28055702	HITRONIC® PCF DUPLEX PNB PVC-PVC A	200/230 PCF	2	7.5	59
28052702	HITRONIC® PCF DUPLEX PNB PVC-PVC	200/230 PCF	2	7.2	55
PCF DUPLEX - PROFINET TYPE C					
28351702	HITRONIC® PCF DUPLEX FD PNC PVC-PUR	200/230 PCF	2	8.8	71
28352702	HITRONIC® PCF DUPLEX FD PNC PVC-PVC	200/230 PCF	2	8.8	76

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- PCF Assembly Sets refer to main catalogue 2018/19
- PCF Connector F-SMA and ST(BFOC) refer to page 223
- PCF Cutting Tools refer to page 225
- PCF Connector SC-RJ refer to page 224
- EPIC® DATA PB Sub-D FO refer to page 71
- STAR STRIP stripping tool refer to main catalogue 2018/19

PCF Connector HFBR

Connectors for polymer cladded optical fibre cables, connectors type HFBR4521

Benefits

- Compatible with HP Versatile Link Connectors and Components series

Application range

- Factory automation
- Medical equipment
- Telecommunications Switching Systems

Product features

- HFBR4521 connector for 2.2 mm PCF cable diameter as crimp version
- HFBR4521 connector for 3.0 mm PCF cable diameter as clamp version
- HFBR4521 clamp connector compatible with Assemby Set PCF Connector HFBR4521

Technical data

ETIM

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

Article number	Article designation	Pieces / PU
Connector HFBR4521 for 2.2 mm cables - crimp version		
29140799	PCF Connector HFBR4521 BK Simplex 2.2 /4PC	4
29140798	PCF Connector HFBR4521 BK Simplex 2.2 /50PC	50
Connector HFBR4521 for 3.0 mm cables - clamp version		
29141799	PCF Connector HFBR4521 Clamp 3.0 /4PC	4
29141798	PCF Connector HFBR4521 Clamp 3.0 /50PC	50

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

PCF Connector F-SMA and ST(BFOC)

Connectors for Polymer Claddes Fibre cables, connector type FSMA and ST(BFOC)

Benefits

- Easy to assemble
- Designed for field assembly
- Reusable as it can be removed

Product features

- Connectors for clamp and cleave assembly
- Available for different cable diameters (2.2mm and 3.0mm)
- Adapters available on request
- Bend protection boot colour: black and red

Technical data

ETIM

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

Article number	Article designation	Pieces / PU
Connector FSMA Clamp for 3.0 mm cables		
29136799	PCF Connector FSMA Clamp 3.0 /4PC	4
29136798	PCF Connector FSMA Clamp 3.0 /50PC	50
Connector FSMA Clamp for 2.2 mm cables		
29135799	PCF Connector SC-RJ Clamp 2.2	4
29135798	PCF Connector FSMA Clamp 2.2 /50PC	50
Connector ST(BFOC) Clamp for 3.0 mm cables		
29126799	PCF Connector ST (BFOC) Clamp 3.0 /4PC	4
29126798	PCF Connector ST (BFOC) Clamp 3.0 /50PC	50
Connector ST(BFOC) Clamp for 2.2 mm cables		
29125799	PCF Connector ST (BFOC) Clamp 2.2 /4PC	4
29125798	PCF Connector ST (BFOC) Clamp 2.2 /50PC	50

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- POF Adapter F-SMA refer to page 215
- POF Adapter ST (BFOC) refer to page 215

Accessories

- PCF Cutting Tools refer to page 225

PCF Connector SC-RJ

Connectors for PCF cables, connector type SC-RJ for clamp and cleave assembly, PROFINET

Benefits

- Easy to assemble
- Designed for field assembly
- Reusable as it can be removed

Product features

- Connector set included two SC connectors, SC-RJ housing, two bending protection boots, dust caps
- Connectors for clamp and cleave assembly
- Available for different cable diameters (2.2mm and 3.0mm)
- Bend protection boot colour: black and red

Info

- Connectors for PROFINET Data Cabling

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

Certifications
SC-RJ complies with IEC61754-24

Article number	Article designation	Pieces / PU
PCF Connector SC-RJ		
29166797	PCF Connector SC-RJ Clamp 3.0	1
29165797	PCF Connector SC-RJ Clamp 2.2	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- PCF Cutting Tools refer to page 225

PCF Assembly Sets

Assembly sets for connector assembly of PCF connector versions: FSMA, ST(BFOC), SC/SC-RJ, HFBR4521

Benefits

- Easy to handle
- Set includes all the necessary tools for connector assembly from clamp connector versions
- Suitable for on-site assembly

Product features

- Sets available for PCF clamp connector types FSMA, ST (BFOC), SC and HFBR4521
- Contents: stripper, cleave tool, kevlar scissor, cutter, microscope

Article number	Article designation	Pieces / PU
Assembly Set For PCF FSMA Connectors		
29500701	Assemby Set PCF Connector FSMA	1
Assembly Set For PCF ST(BFOC) Connectors		
29500702	Assemby Set PCF Connector ST(BFOC)	1
Assembly Set For PCF HFBR4521 Connectors		
29500703	Assembly Set PCF Connector HFBR4521	1
Assembly Set For PCF SC/SC-RJ Connectors		
29500704	Assemby Set PCF Connector SC	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- PCF Connector F-SMA and ST(BFOC) refer to page 223
- PCF Cutting Tools refer to page 225
- PCF Connector SC-RJ refer to page 224

PCF Cutting Tools

Accessories for Polymer Claddes Fibre cables

Benefits

- Optimally coordinated tools for the PCF cable and connector product range
- For the processing of PCF fibres

Product features

- PCF cleaving tool for connector types:
  -FSMA
  -ST(BFOC)
  -HFBR4521
  -SC

Buffered Fibre Stripper

Cleaving tool

Article number	Article designation	Pieces / PU
PCF Buffered Fibre Stripper		
29500711	PCF Buffered Fibre Stripper 0,5 mm (K200/230)	1
PCF Fibre Cleaving Tool		
29500712	PCF Cleaving Tool FSMA Connector	1
29500713	PCF Cleaving Tool ST(BFOC) Connector	1
29500714	PCF Cleaving Tool HFBR4521 Connector	1
29500715	PCF Cleaving Tool SC Connector	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Similar products

- PCF Assembly Sets refer to main catalogue 2018/19

PCF Measurement Equipment

Inspection microscope for PCF connector types: FSMA; ST(BFOC); HFBR

Benefits

- Inspection Microscope with 200x magnification for connector inspection
- Easy to handle

Product features

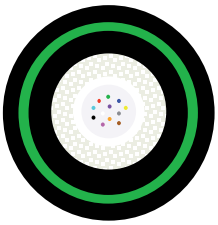
- Interchangeable adapter for PCF connector types FSMA, ST(BFOC), HFBR
- Interchangeable adapters are not included in microscope, please order separately
- Other adapters available on request

Article number	Article designation	Pieces / PU
PCF Inspection Microscope (200x) without adapter		
29500770	PCF Inspection Microscope (200x)	1
PCF Microscope Adapter For Connector Types		
29500771	PCF Microscope Adapter FSMA Simplex	1
29500772	PCF Microscope Adapter ST(BFOC) Simplex	1
29500773	PCF Microscope Adapter HFBR Simplex	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

HITRONIC® FIRE

Safety cable with central loose tube, LSZH inner and outer sheath, corrugated steel tape; halogen-free



Info

- Fire-resistant for at least 180 minutes in the event of fire
- * Cable had been tested to withstand 180 min

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A/J-DQ(ZN)BH(SR)H

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
Fixed installation: 1500 N
Short-term: 2200 N

Temperature range
Fixed installation: -30°C to +70°C

Benefits

- Ensures that the fibres can still transmit data during and after a fire (according to IEC 60331-25)
- Suitable for installation in underground tunnels where fire safety is critical
- Additional sheath protects the fibres for use in harsh environments
- Armouring provides excellent protection against high mechanical stress and rodents
- UV-resistant longitudinally and laterally watertight

Application range

- In industrial areas that use fire as a tool
- Highly combustible or fire-prone areas
- For indoor and outdoor use
- Methods of Deployment: empty plastic pipes, ducts and trays

Product features

- Fire behaviour:
  - Halogen-free (IEC 60754-1)
  - Flame-retardant (IEC 60332-3)
  - Low smoke density (IEC 61034-1/2)
  - Circuit integrity (IEC 60331-25); Optical fibre cables
- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Outer sheath flame-retardant and halogen-free

Product Make-up

- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- Corrugated steel tape armour
- LSZH inner and outer sheaths
- Colour: black (RAL 9005)

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
27560304	HITRONIC® FIRE 4G 50/125 OM3	50/125 OM3	4	9.6	123
27560308	HITRONIC® FIRE 8G 50/125 OM3	50/125 OM3	8	9.6	123
27560312	HITRONIC® FIRE 12G 50/125 OM3	50/125 OM3	12	9.6	123
27560324	HITRONIC® FIRE 24G 50/125 OM3	50/125 OM3	24	12.6	188
Multimode G 50 OM2					
27560204	HITRONIC® FIRE 4G 50/125 OM2	50/125 OM2	4	9.6	123
27560208	HITRONIC® FIRE 8G 50/125 OM2	50/125 OM2	8	9.6	123
27560212	HITRONIC® FIRE 12G 50/125 OM2	50/125 OM2	12	9.6	123
27560224	HITRONIC® FIRE 24G 50/125 OM2	50/125 OM2	24	12.6	188
Multimode G 62.5 OM1					
27560104	HITRONIC® FIRE 4G 62.5/125 OM1	62.5/125 OM1	4	9.6	123
27560108	HITRONIC® FIRE 8G 62.5/125 OM1	62.5/125 OM1	8	9.6	123
27560112	HITRONIC® FIRE 12G 62.5/125 OM1	62.5/125 OM1	12	9.6	123
27560124	HITRONIC® FIRE 24G 62.5/125 OM1	62.5/125 OM1	24	12.6	188
Single-mode E 9 OS2					
27560904	HITRONIC® FIRE 4E 9/125 OS2	9/125 OS2	4	9.6	123
27560908	HITRONIC® FIRE 8E 9/125 OS2	9/125 OS2	8	9.6	123
27560912	HITRONIC® FIRE 12E 9/125 OS2	9/125 OS2	12	9.6	123
27560924	HITRONIC® FIRE 24E 9/125 OS2	9/125 OS2	24	12.6	188

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Available on request with Multimode OM4 fibres.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF SIMPLEX Pigtail refer to page 243
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® TORSION

Breakout cable specially designed to withstand high torsional stresses; PUR outer sheath

Info

- Torsion-resistant and very flexible

Benefits

- Designed to withstand high torsion in the windmill drip loop
- Suitable for field assembly
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For fixed and flexible installations, as well as for applications with torsional movements (e.g. machinery, wind turbines)
- Industrial environments
- In vertical installations
- As a link between moving parts
- For indoor and outdoor use

Product features

- Based on military norm MIL-C-85045
- Torsion-resistant and very flexible
- Outer sheath flame-retardant and halogen-free
- Mechanically robust

Product Make-up

- 2.5 mm tight-buffered sub-cable with LSZH sheath
- Aramid yarns as strain relief
- Central element
- PUR outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
sub-cable: 2.5mm
Cable: see table

Core identification code
Details see datasheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A/J-V(ZN)H11Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Temperature range
Fixed installation: -40°C to +70°C
Occasional flexing: -30°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
26310302	HITRONIC® TORSION 2G 50/125 OM3	50/125 OM3	2	8.4	54
26310304	HITRONIC® TORSION 4G 50/125 OM3	50/125 OM3	4	8.4	54
26310308	HITRONIC® TORSION 8G 50/125 OM3	50/125 OM3	8	11.6	95
26310312	HITRONIC® TORSION 12G 50/125 OM3	50/125 OM3	12	14.7	122
Multimode G 50 OM2					
26310202	HITRONIC® TORSION 2G 50/125 OM2	50/125 OM2	2	8.4	54
26310204	HITRONIC® TORSION 4G 50/125 OM2	50/125 OM2	4	8.4	54
26310208	HITRONIC® TORSION 8G 50/125 OM2	50/125 OM2	8	11.6	95
26310212	HITRONIC® TORSION 12G 50/125 OM2	50/125 OM2	12	14.7	122
Multimode G 62.5 OM1					
26310102	HITRONIC® TORSION 2G 62.5/125 OM1	62.5/125 OM1	2	8.4	54
26310104	HITRONIC® TORSION 4G 62.5/125 OM1	62.5/125 OM1	4	8.4	54
26310108	HITRONIC® TORSION 8G 62.5/125 OM1	62.5/125 OM1	8	11.6	95
26310112	HITRONIC® TORSION 12G 62.5/125 OM1	62.5/125 OM1	12	14.7	122
Single-mode E 9 OS2					
26310902	HITRONIC® TORSION 2E 9/125 OS2	9/125 OS2	2	8.4	54
26310904	HITRONIC® TORSION 4E 9/125 OS2	9/125 OS2	4	8.4	54
26310908	HITRONIC® TORSION 8E 9/125 OS2	9/125 OS2	8	11.6	95
26310912	HITRONIC® TORSION 12E 9/125 OS2	9/125 OS2	12	14.7	122

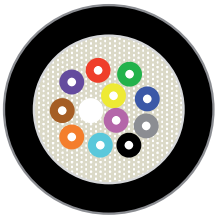
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Available on request with Multimode OM4 fibres.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Connector refer to page 244
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HDM Cable

Mini breakout/distribution cable designed for frequent reeling and unreeling, reelable



Info

- Mobile field cables

Benefits

- Suitable for field application
- Reelable for mobile use
- Very easy to install due to small dimensions, high flexibility, and small bending radius
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- Light & sound technology
- For indoor and outdoor use
- Industrial environments
- TV broadcasts
  Camera technology
  Building monitoring
- Field application

Product features

- Based on military norm MIL-C-85045
- Highly flexible, reelable and tensile strength
- Colour-coded tight buffered fibres for easy channel identification
- Outer sheath halogen-free
- Mechanically robust

Product Make-up

- Up to 12 tight-buffered fibres (900µm)
- Colour-coded
- Aramid yarns as strain relief
- PUR outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description:
Fibre optic cable

Dimensions
tight-buffer (secondary coated fibre): 900µm
Cable: see table

Core identification code
Buffered-fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A/J-V(ZN)11Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Temperature range
Fixed installation: -40°C to +70°C
Flexible use: -20°C to +60°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM4					
26610404	HITRONIC® HDM600 4G 50/125 OM4	50/125 OM4	4	5.5	24
26610406	HITRONIC® HDM600 6G 50/125 OM4	50/125 OM4	6	5.6	29
26610408	HITRONIC® HDM700 8G 50/125 OM4	50/125 OM4	8	6.2	36
Multimode G 50 OM3					
26610304	HITRONIC® HDM600 4G 50/125 OM3	50/125 OM3	4	5.5	24
26610306	HITRONIC® HDM600 6G 50/125 OM3	50/125 OM3	6	5.6	29
26610308	HITRONIC® HDM700 8G 50/125 OM3	50/125 OM3	8	6.2	36
Multimode G 50 OM2					
26610204	HITRONIC® HDM600 4G 50/125 OM2	50/125 OM2	4	5.5	24
26610206	HITRONIC® HDM600 6G 50/125 OM2	50/125 OM2	6	5.6	29
26610208	HITRONIC® HDM700 8G 50/125 OM2	50/125 OM2	8	6.2	36
Multimode G 62.5 OM1					
26610104	HITRONIC® HDM600 4G 62.5/125 OM1	62.5/125 OM1	4	5.5	24
26610106	HITRONIC® HDM600 6G 62.5/125 OM1	62.5/125 OM1	6	5.6	29
26610108	HITRONIC® HDM700 8G 62.5/125 OM1	62.5/125 OM1	8	6.2	36
Single-mode E 9 OS2					
26610904	HITRONIC® HDM600 4E9/125 OS2	9/125 OS2	4	5.5	24
26610906	HITRONIC® HDM600 6E9/125 OS2	9/125 OS2	6	5.6	29
26610908	HITRONIC® HDM700 8E9/125 OS2	9/125 OS2	8	6.2	36
26610912	HITRONIC® HDM700 12E9/125 OS2	9/125 OS2	12	6.7	49

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
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Accessories

- GOF DUPLEX Patchcord refer to page 242
- STAR STRIP stripping tool refer to main catalogue 2018/19

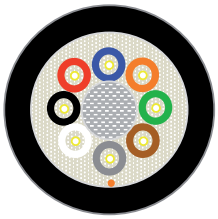
EtherNet/IP

HITRONIC® HRM-FD Cable

flexible deivisible breakout cable designed for use in power chains

Info

- High flexible cables, suitable for drag chains



Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
sub-cable: 2.0mm
Cable: see table

Core identification code
Details see datasheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A/J-V(ZN)H(ZN)11Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Temperature range
Fixed installation: -40°C to +70°C
Flexible use: -20°C to +60°C

Benefits

- Designed for use in power chains
- Suitable for field assembly
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For highly flexible industrial applications
- As a link between moving parts
- In vertical installations
- Industrial environments
- For indoor and outdoor use

Product features

- Based on military norm MIL-C-85045
- For use in power chains and moving machinery parts in dry or damp rooms
- Outer sheath flame-retardant and halogen-free
- Mechanically robust

Product Make-up

- 2.0 mm tight-buffered sub-cable with LSZH sheath
- Aramid yarns as strain relief
- Central element
- PUR outer sheath
- Colour: black (RAL 9005)

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM4					
26300402	HITRONIC® HRM-FD800 2G 50/125 OM4	50/125 OM4	2	7.8	50
26300404	HITRONIC® HRM-FD1000 4G 50/125 OM4	50/125 OM4	4	7.8	50
26300408	HITRONIC® HRM-FD1400 8G 50/125 OM4	50/125 OM4	8	10.4	93
26300412	HITRONIC® HRM-FD1800 12G 50/125 OM4	50/125 OM4	12	13	98
Multimode G 50 OM3					
26300302	HITRONIC® HRM-FD800 2G 50/125 OM3	50/125 OM3	2	7.8	50
26300304	HITRONIC® HRM-FD1000 4G 50/125 OM3	50/125 OM3	4	7.8	50
26300308	HITRONIC® HRM-FD1400 8G 50/125 OM3	50/125 OM3	8	10.4	93
26300312	HITRONIC® HRM-FD1800 12G 50/125 OM3	50/125 OM3	12	13	98
Multimode G 50 OM2					
26300202	HITRONIC® HRM-FD800 2G 50/125 OM2	50/125 OM2	2	7.8	50
26300204	HITRONIC® HRM-FD1000 4G 50/125 OM2	50/125 OM2	4	7.8	50
26300208	HITRONIC® HRM-FD1400 8G 50/125 OM2	50/125 OM2	8	10.4	93
26300212	HITRONIC® HRM-FD1800 12G 50/125 OM2	50/125 OM2	12	13	98
Multimode G 62.5 OM1					
26300102	HITRONIC® HRM-FD800 2G 62.5/125 OM1	62.5/125 OM1	2	7.8	50
26300104	HITRONIC® HRM-FD1000 4G 62.5/125 OM1	62.5/125 OM1	4	7.8	50
26300108	HITRONIC® HRM-FD1400 8G 62.5/125 OM1	62.5/125 OM1	8	10.4	93
26300112	HITRONIC® HRM-FD1800 12G 62.5/125 OM1	62.5/125 OM1	12	13	98
Single-mode E 9 OS2					
26300902	HITRONIC® HRM-FD800 2E 9/125 OS2	9/125 OS2	2	7.8	50
26300904	HITRONIC® HRM-FD1000 4E 9/125 OS2	9/125 OS2	4	7.8	50
26300908	HITRONIC® HRM-FD1400 8E 9/125 OS2	9/125 OS2	8	10.4	93
26300912	HITRONIC® HRM-FD1800 12E 9/125 OS2	9/125 OS2	12	13	98

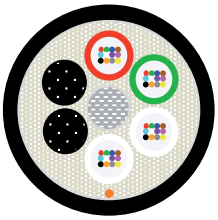
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Connector refer to page 244
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HVN-Mini Cable

Mini outdoor cable designed for installation by air-blowing systems (Ducts)



Info

- Mobile field cables

Benefits

- Suitable for blowing into ducts
- Compact dimensions
- UV-resistant
  longitudinally and laterally watertight
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- Backbone-Area, FTTH applications
- Telecommunications network
- WAN applications
- For installations by blowing
- Methods of deployment: for blowing or pulling into ducts

Product features

- Stranded loose tubes with up to 144 fibres (12 loose tubes with each 12 fibres)
- Colour-coded fibres and loose tubes
- Reduced dimensions
- Halogen-free, low-friction outer sheath
- UV-resistant

Product Make-up

- Up to 12 stranded gel-filled loose tubes
- Central GRP strength element
- Reinforced glass yarn strain relief
- PE outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Fibre type
GOF - Glass Optical Fibre
Single-mode
E9/125 OS2

Standard designation
A-DQ(ZN)2Y

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Temperature range
Fixed installation: -40°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Single-mode E 9 OS2					
26609912	HITRONIC® HVN-Mini500 1x12E 9/125 OS2	9/125 OS2	12	5.8	30
26609924	HITRONIC® HVN-Mini500 2x12E 9/125 OS2	9/125 OS2	24	5.8	30
26609948	HITRONIC® HVN-Mini500 4x12E 9/125 OS2	9/125 OS2	48	5.8	33
26609972	HITRONIC® HVN-Mini500 6x12E 9/125 OS2	9/125 OS2	72	5.8	33
26609996	HITRONIC® HVN-Mini1200 8x12E 9/125 OS2	9/125 OS2	96	7.2	52
26609944	HITRONIC® HVN-Mini1000 12x12E 9/125	9/125 OS2	144	8	80

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF SIMPLEX Pigtail refer to page 243
- DATA STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HQN Outdoor Cable

Outdoor cable with central loose tube and non-metallic strain relief

Info

- Outdoor applications
- Direct burial

Benefits

- Suitable for direct burial
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV-resistant
  longitudinally and laterally watertight
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)
- Suitable for blowing-in technic (low friction outer sheath)

Application range

- For outdoor use
- Campus backbone
- WAN applications
- Industrial environments
- Methods of Deployment: empty plastic pipes, ducts and trays
  Suitable for blowing-in technics

Product features

- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Rodent-protection
- Robust, halogen-free outer sheath

Product Make-up

- Glass fibres with primary coating
- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- PE outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A-DQ(ZN)B2Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
Fixed installation: 1500 N
Short-term: 3000 N

Temperature range
Fixed installation: -40°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
27600304	HITRONIC® HQN 1500 4G 50/125 OM3	50/125 OM3	4	7.3	40
27600308	HITRONIC® HQN 1500 8G 50/125 OM3	50/125 OM3	8	7.3	40
27600312	HITRONIC® HQN 1500 12G 50/125 OM3	50/125 OM3	12	7.3	40
27600324	HITRONIC® HQN 1500 24G 50/125 OM3	50/125 OM3	24	8.3	65
Multimode G 50 OM2					
27600204	HITRONIC® HQN 1500 4G 50/125 OM2	50/125 OM2	4	7.3	40
27600208	HITRONIC® HQN 1500 8G 50/125 OM2	50/125 OM2	8	7.3	40
27600212	HITRONIC® HQN 1500 12G 50/125 OM2	50/125 OM2	12	7.3	40
27600224	HITRONIC® HQN 1500 24G 50/125 OM2	50/125 OM2	24	8.3	65
Multimode G 62.5 OM1					
27600104	HITRONIC® HQN 1500 4G 62.5/125 OM1	62.5/125 OM1	4	7.3	40
27600108	HITRONIC® HQN 1500 8G 62.5/125 OM1	62.5/125 OM1	8	7.3	40
27600112	HITRONIC® HQN 1500 12G 62.5/125 OM1	62.5/125 OM1	12	7.3	40
27600124	HITRONIC® HQN 1500 24G 62.5/125 OM1	62.5/125 OM1	24	8.3	65
Single-mode E 9 OS2					
27600904	HITRONIC® HQN 1500 4E 9/125 OS2	9/125 OS2	4	7.3	40
27600908	HITRONIC® HQN 1500 8E 9/125 OS2	9/125 OS2	8	7.3	40
27600912	HITRONIC® HQN 1500 12E 9/125 OS2	9/125 OS2	12	7.3	40
27600924	HITRONIC® HQN 1500 24E 9/125 OS2	9/125 OS2	24	8.3	65

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Available on request with Multimode OM4 fibres.

Similar products

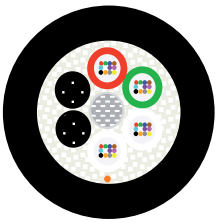
- HITRONIC® HUN Universal Cable refer to page 238
- HITRONIC® HVN Outdoor Cable refer to page 232
- HITRONIC® HQW Armoured Outdoor Cable refer to page 233

Accessories

- GOF SIMPLEX Pigtail refer to page 243
- DATA STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HVN Outdoor Cable

Outdoor cable with stranded loose tubes and non-metallic strain relief



Info

- Telecommunications cable due to higher number of fibers (upto 144)
- Outdoor applications
- Direct burial

Benefits

- Suitable for direct burial
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV-resistant longitudinally and laterally watertight
- Suitable for blowing-in technic (low friction outer sheath)
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For outdoor use
- Campus backbone
- WAN applications
- Industrial environments
- Methods of Deployment: empty plastic pipes, ducts and trays

Product features

- Stranded loose tubes with up to 144 fibres (12 loose tubes with each 12 fibres)
- Colour-coded fibres and loose tubes
- Longitudinal watertight
- Rodent-protection
- Robust, halogen-free outer sheath

Product Make-up

- Up to 12 stranded gel-filled loose tubes
- Central GRP strength element
- Water-blocking reinforced glass yarn strain relief
- PE outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A-DQ(ZN)B2Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Temperature range
Fixed installation: -40°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
26600324	HITRONIC® HVN5000 2x12G 50/125 OM3	50/125 OM3	24	11	64
26600348	HITRONIC® HVN5000 4x12G 50/125 OM3	50/125 OM3	48	11	84
Multimode G 50 OM2					
26600224	HITRONIC® HVN5000 2x12G 50/125 OM2	50/125 OM2	24	11	64
26600248	HITRONIC® HVN5000 4x12G 50/125 OM2	50/125 OM2	48	11	84
Single-mode E 9 OS2					
26600924	HITRONIC® HVN5000 2x12E 9/125 OS2	9/125 OS2	24	11	64
26600948	HITRONIC® HVN5000 4x12E 9/125 OS2	9/125 OS2	48	11	84
HVN Telecom Single-mode E 9 OS2					
26601912	HITRONIC® HVN1500 2x6E 9/125 OS2	9/125 OS2	12	10.5	89
26601924	HITRONIC® HVN1500 2x12E 9/125 OS2	9/125 OS2	24	10.5	89
26601948	HITRONIC® HVN1500 4x12E 9/125 OS2	9/125 OS2	48	10.5	91
26601972	HITRONIC® HVN2000 6x12E 9/125 OS2	9/125 OS2	72	10.8	97
26601996	HITRONIC® HVN2000 8x12E 9/125 OS2	9/125 OS2	96	11.9	121
26601944	HITRONIC® HVN2000 12x12E 9/125 OS2	9/125 OS2	144	14.3	183

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Other models are available upon request.

Similar products

- HITRONIC® HVN-Mini Cable refer to page 230
- HITRONIC® HVW Armoured Outdoor Cable refer to page 234

Accessories

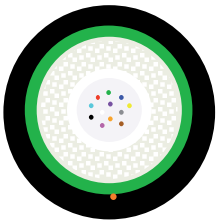
- GOF SIMPLEX Pigtail refer to page 243
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HQW Armoured Outdoor Cable

Outdoor cable with corrugated steel tape, central loose tube, non-metallic strain relief

Info

- Cable with corrugated steel tape (CST) for increased mechanical stress



Benefits

- Armouring provides excellent protection against high mechanical stress and rodents
- Suitable for direct burial
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV-resistant
  longitudinally and laterally watertight

Application range

- For outdoor use
- Campus backbone
- WAN applications
- Industrial environments
- Methods of Deployment: empty plastic pipes, ducts and trays

Product features

- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Excellent rodent protection
- Robust, halogen-free outer sheath

Product Make-up

- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- Corrugated steel tape armour
- PE outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A-DQ(ZN)(SR)2Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
Fixed installation: 3000 N
Short-term: 5000 N

Temperature range
Fixed installation: -40°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
27900304	HITRONIC® HQW3000 4G 50/125 OM3	50/125 OM3	4	9.6	88
27900308	HITRONIC® HQW3000 8G 50/125 OM3	50/125 OM3	8	9.6	88
27900312	HITRONIC® HQW3000 12G 50/125 OM3	50/125 OM3	12	9.6	88
27900324	HITRONIC® HQW3000 24G 50/125 OM3	50/125 OM3	24	9.6	88
Multimode G 50 OM2					
27900204	HITRONIC® HQW3000 4G 50/125 OM2	50/125 OM2	4	9.6	88
27900208	HITRONIC® HQW3000 8G 50/125 OM2	50/125 OM2	8	9.6	88
27900212	HITRONIC® HQW3000 12G 50/125 OM2	50/125 OM2	12	9.6	88
27900224	HITRONIC® HQW3000 24G 50/125 OM2	50/125 OM2	24	9.6	88
Multimode G 62.5 OM1					
27900104	HITRONIC® HQW3000 4G 62.5/125 OM1	62.5/125 OM1	4	9.6	88
27900108	HITRONIC® HQW3000 8G 62.5/125 OM1	62.5/125 OM1	8	9.6	88
27900112	HITRONIC® HQW3000 12G 62.5/125 OM1	62.5/125 OM1	12	9.6	88
27900124	HITRONIC® HQW3000 24G 62.5/125 OM1	62.5/125 OM1	24	9.6	88
Single-mode E 9 OS2					
27900904	HITRONIC® HQW3000 4E 9/125 OS2	9/125 OS2	4	9.6	88
27900908	HITRONIC® HQW3000 8E 9/125 OS2	9/125 OS2	8	9.6	88
27900912	HITRONIC® HQW3000 12E 9/125 OS2	9/125 OS2	12	9.6	88
27900924	HITRONIC® HQW3000 24E 9/125 OS2	9/125 OS2	24	9.6	88

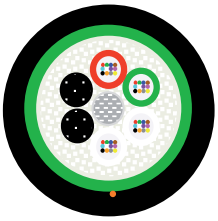
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF SIMPLEX Pigtail refer to page 243
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HVW Armoured Outdoor Cable

Outdoor cable with corrugated steel tape, stranded loose tubes and non-metallic strain relief



Info

- Cable with corrugated steel tape (CST) for increased mechanical stress

Benefits

- Armouring provides excellent protection against high mechanical stress and rodents
- Suitable for direct burial
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV-resistant
  longitudinally and laterally watertight

Application range

- Methods of Deployment: empty plastic pipes, ducts and trays
- For outdoor use
- Campus backbone
- WAN applications
- Industrial environments

Product features

- Stranded loose tubes with up to 144 fibres (12 loose tubes with each 12 fibres)
- Colour-coded fibres and loose tubes
- Longitudinal watertight
- Excellent rodent protection
- Robust, halogen-free outer sheath

Product Make-up

- Up to 12 stranded gel-filled loose tubes
- Water-blocking reinforced glass yarn strain relief
- Corrugated steel tape armour
- PE outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A-DQ(ZN)(SR)2Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
Fixed installation: 3000 N
Short-term: 5000 N

Temperature range
Fixed installation: -40°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Single-mode E 9 OS2					
26900924	HITRONIC® HVW3000 2x12E 9/125 OS2	9/125 OS2	24	10	98
26900948	HITRONIC® HVW3000 4x12E 9/125 OS2	9/125 OS2	48	12.5	148
26900972	HITRONIC® HVW3000 6x12E 9/125 OS2	9/125 OS2	72	16	215
26900996	HITRONIC® HVW3000 8x12E 9/125 OS2	9/125 OS2	96	16	222
26900944	HITRONIC® HVW3000 12x12E 9/125 OS2	9/125 OS2	144	18.5	261

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

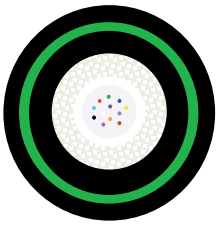
- GOF SIMPLEX Pigtail refer to page 243
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HQW-Plus Armoured Outdoor Cable

Outdoor cable with corrugated steel tape, central loose tube, non-metallic strain relief and PE inner and outer sheath

Info

- Cable with corrugated steel tape (CST) for increased mechanical stress



Benefits

- Additional sheath protects the fibres for use in harsh environments
- Armouring provides excellent protection against high mechanical stress and rodents
- Suitable for direct burial
- UV-resistant longitudinally and laterally watertight

Application range

- For outdoor use
- Harsh industrial environment
- Campus backbone
- WAN applications
- Methods of Deployment: empty plastic pipes, ducts and trays

Product features

- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Excellent rodent protection
- Robust, halogen-free outer sheath

Product Make-up

- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- Corrugated steel tape armour
- PE inner and outer sheaths
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A-DQ(ZN)B2Y(SR)2Y

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
Fixed installation: 3000 N
Short-term: 5000 N

Temperature range
Fixed installation: -40°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
27920304	HITRONIC® HQW-Plus3000 4G 50/125 OM3	50/125 OM3	4	9.6	95
27920308	HITRONIC® HQW-Plus3000 8G 50/125 OM3	50/125 OM3	8	9.6	95
27920312	HITRONIC® HQW-Plus3000 12G 50/125 OM3	50/125 OM3	12	9.6	95
27920324	HITRONIC® HQW-Plus3000 24G 50/125 OM3	50/125 OM3	24	12.6	135
Multimode G 50 OM2					
27920204	HITRONIC® HQW-Plus3000 4G 50/125 OM2	50/125 OM2	4	9.6	95
27920208	HITRONIC® HQW-Plus3000 8G 50/125 OM2	50/125 OM2	8	9.6	95
27920212	HITRONIC® HQW-Plus3000 12G 50/125 OM2	50/125 OM2	12	9.6	95
27920224	HITRONIC® HQW-Plus3000 24G 50/125 OM2	50/125 OM2	24	12.6	135
Multimode G 62.5 OM1					
27920104	HITRONIC® HQW-Plus3000 4G 62.5/125 OM1	62.5/125 OM1	4	9.6	95
27920108	HITRONIC® HQW-Plus3000 8G 62.5/125 OM1	62.5/125 OM1	8	9.6	95
27920112	HITRONIC® HQW-Plus3000 12G 62.5/125 OM1	62.5/125 OM1	12	9.6	95
27920124	HITRONIC® HQW-Plus3000 24G 62.5/125 OM1	62.5/125 OM1	24	12.6	135
Single-mode E 9 OS2					
27920904	HITRONIC® HQW-Plus3000 4E 9/125 OS2	9/125 OS2	4	9.6	95
27920908	HITRONIC® HQW-Plus3000 8E 9/125 OS2	9/125 OS2	8	9.6	95
27920912	HITRONIC® HQW-Plus3000 12E 9/125 OS2	9/125 OS2	12	9.6	95
27920924	HITRONIC® HQW-Plus3000 24E 9/125 OS2	9/125 OS2	24	12.6	135

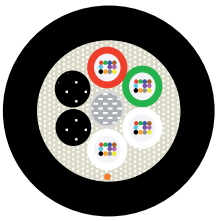
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF SIMPLEX Pigtail refer to page 243
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HQA Aerial Cable

Outdoor self-supporting aerial cable with stranded loose tubes and non-metallic strain relief; ADSS cable type



Info

- Aerial cables (ADSS- All Dielectric Self Supporting)

Benefits

- Suitable for mild weather conditions
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV-resistant
  longitudinally and laterally watertight
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For outdoor use
- Hanging on poles
- Laying on poles
- Installation on building columns

Product features

- Stranded loose tubes with up to 96 fibres
- Colour-coded fibres and loose tubes
- Mechanical support members (central filler and aramid yarns)
- Robust, halogen-free outer sheath
- Span width up to 90m

Product Make-up

- Up to 8 stranded gel-filled loose tubes
- Central GRP strength element
- Aramid yarns as strain relief
- PE outer sheath
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A-DQ(ZN)2Y - ADSS
All-Dielectric Self-Supporting

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
MAT: 2000 N
EDS: 800 N

Temperature range
Fixed installation: -40°C to +70°C
Occasional flexing: -30°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Single-mode E 9 OS2					
26640912	HITRONIC® HQA800 6x2E 9/125 OS2	9/125 OS2	12	9.7	73
26640924	HITRONIC® HQA800 6x4E 9/125 OS2	9/125 OS2	24	9.7	73
26640948	HITRONIC® HQA800 6x8E 9/125 OS2	9/125 OS2	48	10.9	92
26640972	HITRONIC® HQA800 6x12E 9/125 OS2	9/125 OS2	72	10.9	94
26640996	HITRONIC® HQA800 8x12E 9/125 OS2	9/125 OS2	96	12.4	121

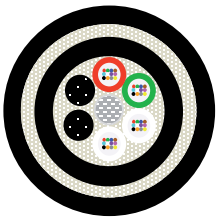
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Further cable versions are available on request.

Accessories

- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HQA-Plus Aerial Cable

Outdoor self-supporting aerial cable with stranded loose tubes, non-metallic strain relief and PE inner and outer sheath; ADSS cable type



Info

- Aerial cables with span width of upto 250 m (ADSS- All Dielectric Self Supporting)
- For harsh weather conditions

Benefits

- Designed to withstand harsh weather conditions
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV-resistant
  longitudinally and laterally watertight
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For long span widths
- Hanging on poles
- For outdoor use
- Laying on poles
- Installation on building columns

Product features

- Stranded loose tubes with up to 96 fibres
- Colour-coded fibres and loose tubes
- Mechanical support members (central filler and aramid yarns)
- Robust, halogen-free outer sheath
- Span width up to 250m

Product Make-up

- Up to 8 stranded gel-filled loose tubes
- Central GRP strength element
- Aramid yarns as strain relief
- PE inner and outer sheaths
- Colour: black (RAL 9005)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A-DQ2Y(ZN)2Y ADSS
All-Dielectric Self-Supporting

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
MAT: 8000 N
EDS: 3200 N

Temperature range
Fixed installation: -40°C to +70°C
Occasional flexing: -30°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Single-mode E 9 OS2					
26644912	HITRONIC® HQA-Plus3200 6x2E 9/125 OS2	9/125 OS2	12	12.8	132
26644924	HITRONIC® HQA-Plus3200 6x4E 9/125 OS2	9/125 OS2	24	12.8	132
26644948	HITRONIC® HQA-Plus3200 6x8E 9/125 OS2	9/125 OS2	48	13.7	151
26644972	HITRONIC® HQA-Plus3200 6x12E 9/125 OS2	9/125 OS2	72	13.7	153
26644996	HITRONIC® HQA-Plus3200 8x12E 9/125 OS2	9/125 OS2	96	15.3	188

Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Further cable versions are available on request.

Accessories

- STAR STRIP stripping tool refer to main catalogue 2018/19

EtherNet/IP

HITRONIC® HUN Universal Cable

Universal cable with corrugated steel tape armour, central loose tube and non-metallic strain relief

Info

- CPR: Article number choice under www.lappkabel.com/cpr
- For indoor and outdoor use

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A/J-DQ(ZN)BH
U-DQ(ZN)BH

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
Fixed installation: 1500 N
Short-term: 2000 N

Temperature range
Fixed installation: -30°C to +70°C

Benefits

- Flame retardance makes it suitable for indoor and outdoor installations
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- UV-resistant
  longitudinally and laterally watertight
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For indoor and outdoor use
- Campus backbone
- Industrial environments
- Methods of Deployment: empty plastic pipes, ducts and trays

Product features

- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Outer sheath flame-retardant and halogen-free
- Rodent-protection

Product Make-up

- Glass fibres with primary coating
- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- LSZH outer sheath
- Colour: dark grey

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM4					
27400404	HITRONIC® HUN1500 4G 50/125 OM4	50/125 OM4	4	7.3	53
27400408	HITRONIC® HUN1500 8G 50/125 OM4	50/125 OM4	8	7.3	53
27400412	HITRONIC® HUN1500 12G 50/125 OM4	50/125 OM4	12	7.3	53
27400424	HITRONIC® HUN1500 24G 50/125 OM4	50/125 OM4	24	8.3	60
Multimode G 50 OM3					
27400304	HITRONIC® HUN1500 4G 50/125 OM3	50/125 OM3	4	7.3	53
27400308	HITRONIC® HUN1500 8G 50/125 OM3	50/125 OM3	8	7.3	53
27400312	HITRONIC® HUN1500 12G 50/125 OM3	50/125 OM3	12	7.3	53
27400324	HITRONIC® HUN1500 24G 50/125 OM3	50/125 OM3	24	8.3	60
Multimode G 50 OM2					
27400204	HITRONIC® HUN1500 4G 50/125 OM2	50/125 OM2	4	7.3	53
27400208	HITRONIC® HUN1500 8G 50/125 OM2	50/125 OM2	8	7.3	53
27400212	HITRONIC® HUN1500 12G 50/125 OM2	50/125 OM2	12	7.3	53
27400224	HITRONIC® HUN1500 24G 50/125 OM2	50/125 OM2	24	8.3	60
Multimode G 62.5 OM1					
27400104	HITRONIC® HUN1500 4G 62.5/125 OM1	62.5/125 OM1	4	7.3	53
27400108	HITRONIC® HUN1500 8G 62.5/125 OM1	62.5/125 OM1	8	7.3	53
27400112	HITRONIC® HUN1500 12G 62.5/125 OM1	62.5/125 OM1	12	7.3	53
27400124	HITRONIC® HUN1500 24G 62.5/125 OM1	62.5/125 OM1	24	8.3	60
Single-mode E 9 OS2					
27400904	HITRONIC® HUN1500 4E 9/125 OS2	9/125 OS2	4	7.3	53
27400908	HITRONIC® HUN1500 8E 9/125 OS2	9/125 OS2	8	7.3	53
27400912	HITRONIC® HUN1500 12E 9/125 OS2	9/125 OS2	12	7.3	53
27400924	HITRONIC® HUN1500 24E 9/125 OS2	9/125 OS2	24	8.3	60

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF SIMPLEX Pigtail refer to page 243
- DATA STRIP stripping tool refer to main catalogue 2018/19

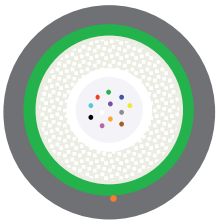
EtherNet/IP

HITRONIC® HUW Armoured Universal Cable

Universal cable with central loose tube, corrugated steel tape and non-metallic strain relief for applications with extended mechanical stress

Info

- CPR: Article number choice under www.lappkabel.com/cpr
- For indoor and outdoor use
- Cable with corrugated steel tape (CST) for increased mechanical stress



Benefits

- Armouring provides excellent protection against high mechanical stress and rodents
- Flame retardance makes it suitable for indoor and outdoor installations
- Easy to install due to the compact design, high flexibility, robust sheath and small bending radii
- Water-resistant

Application range

- For indoor and outdoor use
- Campus backbone
- Industrial environments
- Methods of Deployment: empty plastic pipes, ducts and trays

Product features

- Outer sheath flame-retardant and halogen-free
- Central loose tube with up to 24 fibres
- Colour-coded fibres
- Longitudinal watertight
- Excellent rodent protection

Product Make-up

- Gel-filled loose tube
- Water-blocking reinforced glass yarn strain relief
- Corrugated steel tape armour
- LSZH outer sheath
- Colour: green (based on RAL 6018)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
Primary coated fibre: 250µm
Cable: see table

Core identification code
Fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
A/J-DQ(ZN)(SR)H
U-DQ(ZN)(SR)H

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Permissible tensile force
Fixed installation: 1500 N
Short-term: 2000 N

Temperature range
Fixed installation: -30°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
27500304	HITRONIC® HUW1500 4G 50/125 OM3	50/125 OM3	4	9.6	88
27500308	HITRONIC® HUW1500 8G 50/125 OM3	50/125 OM3	8	9.6	88
27500312	HITRONIC® HUW1500 12G 50/125 OM3	50/125 OM3	12	9.6	88
27500324	HITRONIC® HUW1500 24G 50/125 OM3	50/125 OM3	24	9.6	88
Multimode G 50 OM2					
27500204	HITRONIC® HUW1500 4G 50/125 OM2	50/125 OM2	4	9.6	88
27500208	HITRONIC® HUW1500 8G 50/125 OM2	50/125 OM2	8	9.6	88
27500212	HITRONIC® HUW1500 12G 50/125 OM2	50/125 OM2	12	9.6	88
27500224	HITRONIC® HUW1500 24G 50/125 OM2	50/125 OM2	24	9.6	88
Multimode G 62.5 OM1					
27500104	HITRONIC® HUW1500 4G 62.5/125 OM1	62.5/125 OM1	4	9.6	88
27500108	HITRONIC® HUW1500 8G 62.5/125 OM1	62.5/125 OM1	8	9.6	88
27500112	HITRONIC® HUW1500 12G 62.5/125 OM1	62.5/125 OM1	12	9.6	88
27500124	HITRONIC® HUW1500 24G 62.5/125 OM1	62.5/125 OM1	24	9.6	88
Single-mode E 9 OS2					
27500904	HITRONIC® HUW1500 4E 9/125 OS2	9/125 OS2	4	9.6	88
27500908	HITRONIC® HUW1500 8E 9/125 OS2	9/125 OS2	8	9.6	88
27500912	HITRONIC® HUW1500 12E 9/125 OS2	9/125 OS2	12	9.6	88
27500924	HITRONIC® HUW1500 24E 9/125 OS2	9/125 OS2	24	9.6	88

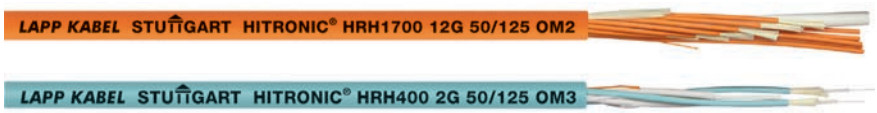
Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Available on request with Multimode OM4 fibres.

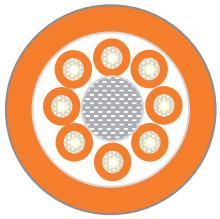
Accessories

- GOF SIMPLEX Pigtail refer to page 243
- STAR STRIP stripping tool refer to main catalogue 2018/19

HITRONIC® HRH Breakout Cable

Divisible breakout cable for direct connector assembly; J-V(ZN)HH





Info

- CPR: Article number choice under www.lappkabel.com/cpr
- Breakout cable for direct connector assembly

Benefits

- Suitable for field assembly
- Universal cable for cabling of buildings
- Very easy to install due to compact design, high flexibility, and small bending radii
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For indoor use
- Tertiary cabling
- Structured cabling - backbone
- Methods of Deployment: laying in trunking, ducts, trays, empty plastic pipes, building riser, raised floors and plenums

Product features

- Installation cable with up to 12 Simplex cables
- Outer sheath flame-retardant and halogen-free
- Mechanically robust

Product Make-up

- 2.1 mm tight-buffered sub-cable with LSZH sheath (identified by numbers)
- Central GRP strength element
- Aramid yarns as strain relief
- LSZH inner and outer sheaths
- Colour: aqua (RAL 6027) for OM3, orange (RAL 2003) for OM2 and OM1, yellow for Single-mode

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
tight-buffer (secondary coated fibre): 900µm
sub-cable: 2.1mm

Core identification code
Sub-cable: with black numbers

Fibre type
GOF - Glass Optical Fibre

Standard designation
J-V(ZN)HH

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Temperature range
Fixed installation: -20°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
26000302	HITRONIC® HRH400 2G 50/125 OM3	50/125 OM3	2	7	35
26000304	HITRONIC® HRH600 4G 50/125 OM3	50/125 OM3	4	7	44
26000308	HITRONIC® HRH1200 8G 50/125 OM3	50/125 OM3	8	9.7	77
26000312	HITRONIC® HRH1700 12G 50/125 OM3	50/125 OM3	12	10.3	100
Multimode G 50 OM2					
26000202	HITRONIC® HRH400 2G 50/125 OM2	50/125 OM2	2	7	35
26000204	HITRONIC® HRH600 4G 50/125 OM2	50/125 OM2	4	7	44
26000208	HITRONIC® HRH1200 8G 50/125 OM2	50/125 OM2	8	9.7	77
26000212	HITRONIC® HRH1700 12G 50/125 OM2	50/125 OM2	12	10.3	100
Multimode G 62.5 OM1					
26000102	HITRONIC® HRH400 2G 62.5/125 OM1	62.5/125 OM1	2	7	35
26000104	HITRONIC® HRH600 4G 62.5/125 OM1	62.5/125 OM1	4	7	44
26000108	HITRONIC® HRH1200 8G 62.5/125 OM1	62.5/125 OM1	8	9.7	77
26000112	HITRONIC® HRH1700 12G 62.5/125 OM1	62.5/125 OM1	12	10.3	100
Single-mode E 9 OS2					
26000902	HITRONIC® HRH400 2E 9/125 OS2	9/125 OS2	2	7	35
26000904	HITRONIC® HRH600 4E 9/125 OS2	9/125 OS2	4	7	44
26000908	HITRONIC® HRH1200 8E 9/125 OS2	9/125 OS2	8	9.7	77
26000912	HITRONIC® HRH1700 12E 9/125 OS2	9/125 OS2	12	10.3	100

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Available on request with multi-mode OM4 fibres
(outer sheath colour violet).

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Connector refer to page 244
- DATA STRIP stripping tool refer to main catalogue 2018/19
- Ty-Grip® FOL / FO Cable tie refer to main catalogue 2018/19

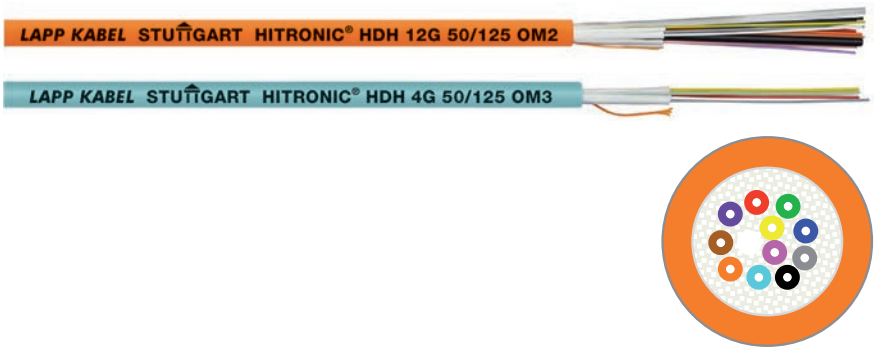
EtherNet/IP

HITRONIC® HDH Mini-Breakout Cable

Divisible indoor cable (distribution-style) with LSZH outer sheath, halogenfree; J-V(ZN)HH

Info

- CPR: Article number choice under www.lappkabel.com/cpr
- Mini breakout/distribution cable for direct connector assembly



Benefits

- Very easy to install due to small dimensions, high flexibility, and small bending radius
- Suitable for field assembly
- Universal cable for cabling of buildings
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For indoor use
- Tertiary cabling
- Structured cabling - backbone
- Methods of Deployment: laying in trunking, ducts, trays, empty plastic pipes, building riser, raised floors and plenums

Product features

- Up to 12 tight-buffered fibres (900µm)
- Colour-coded fibres
- Outer sheath flame-retardant and halogen-free
- Mechanically robust

Product Make-up

- Tight-buffered fibres
- Water-blocking reinforced glass yarn strain relief
- LSZH outer sheath
- Colour: aqua (RAL 6027) for OM3, orange (RAL 2003) for OM2 and OM1
- Available on request: single-mode OS2 (yellow) and multimode OM4 (violet)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000034
ETIM 5.0/6.0 Class-Description: Fibre optic cable

Dimensions
tight-buffer (secondary coated fibre): 900µm
Cable: see table

Core identification code
Buffered-fibre colour code see data sheet

Fibre type
GOF - Glass Optical Fibre

Standard designation
J-V(ZN)H

Optical values
see data sheet

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 15 x outer diameter
Dynamic: ≥ 20 x outer diameter

Temperature range
Fixed installation: -20°C to +70°C

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
Multimode G 50 OM3					
26010302	HITRONIC® HDH 2G 50/125 OM3	50/125 OM3	2	6	34
26010304	HITRONIC® HDH 4G 50/125 OM3	50/125 OM3	4	6.3	37
26010308	HITRONIC® HDH 8G 50/125 OM3	50/125 OM3	8	7.5	57
26010312	HITRONIC® HDH 12G 50/125 OM3	50/125 OM3	12	8.3	69
Multimode G 50 OM2					
26010202	HITRONIC® HDH 2G 50/125 OM2	50/125 OM2	2	6	34
26010204	HITRONIC® HDH 4G 50/125 OM2	50/125 OM2	4	6.3	37
26010208	HITRONIC® HDH 8G 50/125 OM2	50/125 OM2	8	7.5	57
26010212	HITRONIC® HDH 12G 50/125 OM2	50/125 OM2	12	8.3	69
Multimode G 62.5 OM1					
26010102	HITRONIC® HDH 2G 62.5/125 OM1	62.5/125 OM1	2	6	34
26010104	HITRONIC® HDH 4G 62.5/125 OM1	62.5/125 OM1	4	6.3	37
26010108	HITRONIC® HDH 8G 62.5/125 OM1	62.5/125 OM1	8	7.5	57
26010112	HITRONIC® HDH 12G 62.5/125 OM1	62.5/125 OM1	12	8.3	69

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
The cables can also be supplied as pre-terminated fibre optic trunks.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.
Available on request with Multimode OM4 fibres.

Accessories

- DATA STRIP stripping tool refer to main catalogue 2018/19
- Ty-Grip® FOL / FO Cable tie refer to main catalogue 2018/19

GOF DUPLEX Patchcord

Optical patch cords with various types of connectors available in single-mode or multi-mode fibre version

Info

- Pre-assembled duplex tight-buffered optical fibre cables with durable ceramic ferrule connectors
- Other types are available at www.lappgroup.com/assemblyfinder or on request

Benefits

- To connect optical transmitter, receiver and terminal box
- „Plug & Play“ connection between optical devices
- Non-permanent connections allow for easy change of equipment
- For direct connection between two active optical components

Application range

- For indoor use
- LAN connections
- Data Centers
- Distributor cabinet

Product features

- Outer sheath flame-retardant and halogen-free
- High flexibility
- Cable termination with durable ceramic ferrules
- Pre-assembled connectors:
  -Low insertion loss
  -High return loss

Norm references / Approvals

- LC comply with IEC standard 61754-20
- SC comply with IEC standard 61754-4
- ST comply with IEC standard 61754-2
- FC complies with IEC61754-13

Product Make-up

- Tight-buffered duplex cable with LSZH outer sheath
- Connector: LC, SC or ST
- Cable colour:
  violet for multimode OM4,
  aqua for multimode OM3,
  orange for multimode OM2 and OM1,
  yellow for single-mode OS2
- Standard length: 2 m
- On request: 1 m, 3 m, 5 m and 10 m

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001263
ETIM 5.0/6.0 Class-Description: Fibre optic patch cord

Dimensions
Primary coated fibre: 250µm
tight-buffer (secondary coated fibre): 900µm
sub-cable: 1.9mm

Fibre type
GOF - Glass Optical Fibre

Standard designation
J-VH 2x1G/E...

Optical fibre type
Core material: glass
Cladding material: glass

Permissible bending radius
Static: ≥ 30 mm
Dynamic: ≥ 40 mm

Permissible tensile force
Fixed installation: 100 N

Temperature range
Fixed installation: -20°C to +60°C
Occasional flexing: -5°C to +50°C

Article number	Article designation	Pieces / PU
Multimode G 50 OM4		
29011402	GOF Duplex Patchcord SC/SC G50 OM4, 2m	1
29021402	GOF Duplex Patchcord ST/SC G50 OM4, 2m	1
29022402	GOF Duplex Patchcord ST/ST G50 OM4, 2m	1
29031402	GOF Duplex Patchcord LC/SC G50 OM4, 2m	1
29032402	GOF Duplex Patchcord LC/ST G50 OM4, 2m	1
29033402	GOF Duplex Patchcord LC/LC G50 OM4, 2m	1
29044402	GOF Duplex Patchcord FC/FC G50 OM4, 2m	1
Multimode G 50 OM3		
29011302	GOF Duplex Patchcord SC/SC G50 OM3, 2m	1
29021302	GOF Duplex Patchcord ST/SC G50 OM3, 2m	1
29022302	GOF Duplex Patchcord ST/ST G50 OM3, 2m	1
29031302	GOF Duplex Patchcord LC/SC G50 OM3, 2m	1
29032302	GOF Duplex Patchcord LC/ST G50 OM3, 2m	1
29033302	GOF Duplex Patchcord LC/LC G50 OM3, 2m	1
29044302	GOF Duplex Patchcord FC/FC G50 OM3, 2m	1
Multimode G 50 OM2		
29011202	GOF Duplex Patchcord SC/SC G50 OM2, 2m	1
29021202	GOF Duplex Patchcord ST/SC G50 OM2, 2m	1
29022202	GOF Duplex Patchcord ST/ST G50 OM2, 2m	1
29031202	GOF Duplex Patchcord LC/SC G50 OM2, 2m	1
29032202	GOF Duplex Patchcord LC/ST G50 OM2, 2m	1
29033202	GOF Duplex Patchcord LC/LC G50 OM2, 2m	1
29044202	GOF Duplex Patchcord FC/FC G50 OM2, 2m	1
Multimode G 62.5 OM1		
29011102	GOF Duplex Patchcord SC/SC G62.5, 2m	1
29021102	GOF Duplex Patchcord ST/SC G62.5, 2m	1
29022102	GOF Duplex Patchcord ST/ST G62.5, 2m	1
29031102	GOF Duplex Patchcord LC/SC G62.5, 2m	1
29032102	GOF Duplex Patchcord LC/ST G62.5, 2m	1
29033102	GOF Duplex Patchcord LC/LC G62.5, 2m	1
29044102	GOF Duplex Patchcord FC/FC G62.5, 2m	1
Single-mode E 9 OS2		
29011902	GOF Duplex Patchcord SC/SC E9 OS2, 2m	1
29021902	GOF Duplex Patchcord ST/SC E9 OS2, 2m	1
29022902	GOF Duplex Patchcord ST/ST E9 OS2, 2m	1
29031902	GOF Duplex Patchcord LC/SC E9 OS2, 2m	1
29032902	GOF Duplex Patchcord LC/ST E9 OS2, 2m	1
29033902	GOF Duplex Patchcord LC/LC E9 OS2, 2m	1
29033802	GOF DUPLEX Patchcord LC/LC 9/125 APC, 2m	1
29039902	GOF DUPLEX Patchcord LC/SC-APC E9 OS2, 2m	1

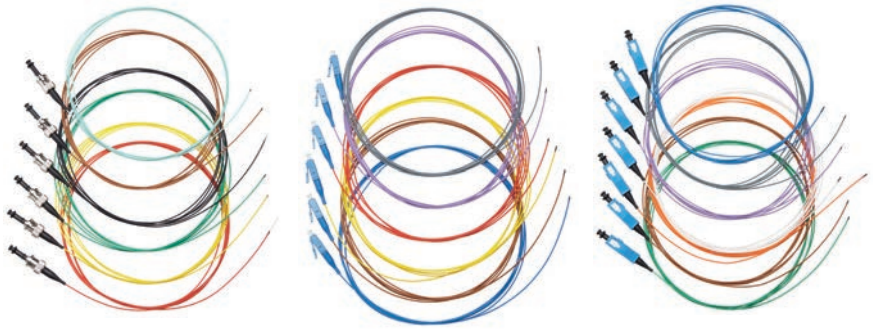
Other lengths and types of connectors are available upon request. / Photographs and graphics are not to scale and do not represent detailed images of the respective products.

GOF SIMPLEX Pigtail

12x assorted colour coded pigtails with various types of connectors (LC, ST, LC) with Singlemode OS2 and Multimode OM1, OM2, OM3, OM4 fibres

Info

- Pre-assembled simplex tight-buffered optical fibre with a durable ceramic ferrule connector



Benefits

- Ease of installation and assembly
- Create a direct plug connection for installation cables with splicing
- Zero electromagnetic interference as the cable contains no metal (totally dielectric)

Application range

- For indoor use
- Connection to an end optical device

Product features

- High flexibility
- Cable termination with durable ceramic ferrules
- Set consisting of 12 colour-coded pigtails (red, green, blue, yellow, white, gray, brown, violet, turquoise, black, orange, pink)

Norm references / Approvals

- LC comply with IEC standard 61754-20
- SC comply with IEC standard 61754-4
- ST comply with IEC standard 61754-2

Product Make-up

- Tight buffered simplex fibres
- Connector: LC, SC or ST
- Colour-coded primary and secondary coatings
- Standard length: 2 m

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000748
ETIM 5.0/6.0 Class-Description: Pigtail

Dimensions
Primary coated fibre: 250µm
tight-buffer (secondary coated fibre): 900µm

Fibre type
GOF - Glass Optical Fibre

Standard designation
J-VH 1G/E...

Optical fibre type
Core material: glass
Cladding material: glass

Permissible tensile force
Fixed installation: 100 N

Temperature range
Fixed installation: -20°C to +60°C
Occasional flexing: -5°C to +50°C

Article number	Article designation	Pieces / PU
Multimode G 50 OM4		
29310402	GOF Simplex Pigtail SC G50 OM4, 2m	12
29320402	GOF Simplex Pigtail ST G50 OM4, 2m	12
29330402	GOF Simplex Pigtail LC G50 OM4, 2m	12
Multimode G 50 OM3		
29310302	GOF Simplex Pigtail SC G50 OM3, 2m	12
29320302	GOF Simplex Pigtail ST G50 OM3, 2m	12
29330302	GOF Simplex Pigtail LC G50 OM3, 2m	12
Multimode G 50 OM2		
29310202	GOF Simplex Pigtail SC G50 OM2, 2m	12
29320202	GOF Simplex Pigtail ST G50 OM2, 2m	12
29330202	GOF Simplex Pigtail LC G50 OM2, 2m	12
Multimode G 62.5 OM1		
29310102	GOF Simplex Pigtail SC G62.5, 2m	12
29320102	GOF Simplex Pigtail ST G62.5, 2m	12
29330102	GOF Simplex Pigtail LC G62.5, 2m	12
Single-mode E 9 OS2		
29310902	GOF Simplex Pigtail SC E9 OS2, 2m	12
29320902	GOF Simplex Pigtail ST E9 OS2, 2m	12
29330902	GOF Simplex Pigtail LC E9 OS2, 2m	12

Other types of connectors (e.g. LC, MTRJ, E2000) are available upon request.Judy Lim:This will not apply to Hitronic anymore, as LC will become a standard product and MTRJ/E2000 will be removed.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

GOF Connector

Accessories for glass optical fibre cable, connector types LC, SC, ST and FC

LC

SC

ST

Benefits

- Ideal for assembling
- For assembly process: cable preparation/ glueing/crimping/polishing
- Assembly instructions can be found in the GOF assembly toolbox (not included in Lapp product range)
- Trained optical installers should be used in all connector assembly

Application range

- For connector assemblies in production or laboratory environment

Product features

- Connector sets include all needed parts for assembly

Norm references / Approvals

- LC comply with IEC standard 61754-20
- SC comply with IEC standard 61754-4
- ST comply with IEC standard 61754-2

Product Make-up

- Ferrule diameter:
  LC: 1.25mm (zirconia)
  SC, ST: 2.5mm (zirconia)
- Can be assembled with cables of 1.7mm-2.1mm diameter
- LC and SC connector sets available in green (single-mode APC), blue (single-mode PC) and grey (multimode)

Info

- Pre-assembled simplex tight-buffered optical fibre with a durable ceramic ferrule connector

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001122
ETIM 5.0/6.0 Class-Description: Fibre optic connector

Permissible tensile force
Tensile load 70N
Tensile strength after assembly > 100N

Temperature range
Operating
LC: -40°C to 75°C
SC: -40°C to 75°C
ST: -40°C to 85°C
Humidity 95%
Flammability UL 94 V-0

Article number	Article designation	Pieces / PU
Singlemode		
29110999	GOF Connector SC Single-mode Blue /4PC	4
29110998	GOF Connector SC Single-mode Blue /50PC	50
29110989	GOF Connector SC Single-mode APC Green/ 4PC	4
29110988	GOF Connector SC Single-mode APC Green/ 50PC	50
29130999	GOF Connector LC Single-mode Blue /4PC	4
29130998	GOF Connector LC Single-mode Blue /50PC	50
29130989	GOF Connector LC Single-mode APC GR /4PC	4
29130988	GOF Connector LC Single-mode APC GR/50PC	50
29120999	GOF Connector ST Single-mode /4PC	4
29120998	GOF Connector ST Single-mode /50PC	50
29140999	GOF Connector FC Single-mode /4PC	4
Multimode		
29110199	GOF Connector SC Multimode Beige /4PC	4
29110198	GOF Connector SC Multimode Beige /50PC	50
29130199	GOF Connector LC Multimode Beige /4PC	4
29130198	GOF Connector LC Multimode Beige /50PC	50
29120199	GOF Connector ST Multimode /4PC	4
29120198	GOF Connector ST Multimode /50PC	50
29140199	GOF Connector FC Multimode /4PC	4

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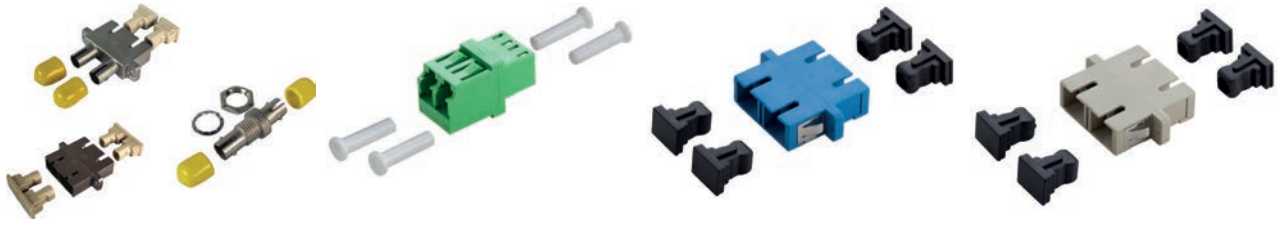
GOF Adapters

Accessories for glass optical fibre cable, adapters for connector types LC, SC and ST



Product features

- The couplings connect the glass fibre connectors with the same or different connector types.

Norm references / Approvals

- LC comply with IEC standard 61754-20
- SC comply with IEC standard 61754-4
- ST comply with IEC standard 61754-2
- Comply with IEC, EIA/TIA standards

Product Make-up

- Zirconia sleeves
- LC and SC adapters available in green (single-mode APC), blue (single-mode PC) and grey (multimode)

Technical data

ETIM

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC000752
ETIM 5.0/6.0 Class-Description: Fibre optic coupler

Attenuation
Attenuation (dB) < 0.2
Repeatability
1000 cycles (dB) < 0.2

Temperature range
Operating
LC: -25°C to 70°C
SC: -40°C to 75°C
ST: -40°C to 85°C
Humidity 95%
Flammability UL 94 V-0

Article number	Article designation	Pieces / PU
Singlemode		
29410999	GOF Adapter Duplex SC Single-mode Blue /4PC	4
29410989	GOF Adapter Duplex SC Single-mode APC Green /4PC	4
29430999	GOF Adapter Duplex LC Single-mode Blue /4PC	4
29430989	GOF Adapter Duplex LC Single-mode APC Green /4PC	4
29420999	GOF Adapter Simplex ST(BFOC) Single-mode /4PC	4
29421999	GOF Adapter Duplex ST-SC Single-mode /4PC	4
Multimode		
29410199	GOF Adaper Duplex SC Multimode Beige /4PC	4
29430199	GOF Adaper Duplex LC Multimode Beige /4PC	4
29420199	GOF Adapter Simplex ST(BFOC) Multimode /4PC	4
29421199	GOF Adaper Duplex ST-SC Multimode /4PC	4

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

19“ Splice Box for ST

Product features

- For up to 12 or 24 fibres
- Can be pulled out
- Unpopulated
- For a maximum of 4 splicing catridges
- Height: 1 RU
- Dimensions (WxHxD): 483 x 44.5 x 244 mm
- Material: steel plate, 1.5 mm
- Colour: light grey (RAL 7035)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001130
ETIM 5.0/6.0 Class-Description: Patch panel fibre optic

Article number	Article designation	Pieces / PU
Splice Box Compact		
CE9138	19“ Splice Box for 12 ST	1
CE9139	19“ Splice Box for 24 ST	1

Splice boxes for more fibres with other types of connectors are available upon request. Also available in pre-assembled versions with coupings and pigtails.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Adapters refer to page 245
- GOF SIMPLEX Pigtail refer to page 243
- Accessories for splice boxes and wall-mounted rack refer to page 248

19“ Splice Box for SC

Product features

- For up to 24 fibres
- Included: front panel with 12 SC-duplex holes
- Can be pulled out
- Unpopulated
- Height: 1 RU
- Material: steel plate, 1.5 mm
- Colour: light grey (RAL 7035)

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001130
ETIM 5.0/6.0 Class-Description: Patch panel fibre optic

Article number	Article designation	Pieces / PU
Splice Box Compact		
CE9135	19“ Splice Box for SC	1

Splice boxes for more fibres with other types of connectors are available upon request. Also available in pre-assembled versions with coupings and pigtails.
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Adapters refer to page 245
- GOF SIMPLEX Pigtail refer to page 243
- Accessories for splice boxes and wall-mounted rack refer to page 248

Splice Box Compact

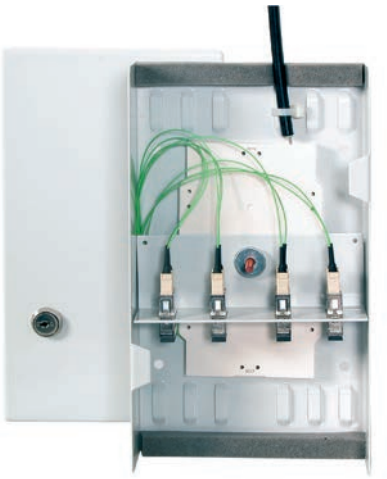
Product features

- Panel mounting
- Lockable
- Max. capacity of 8 splicing cartridges or 4 splicing cartridges and one distribution plate
- Includes distributor plate for 8 ST couplings
- Includes distributor plate for 4 SC duplex couplings
- Dimensions (WxHxD): 265 x 150 x 55 mm
- Colour: light grey (RAL 7035)

Technical data

ETIM

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001130
ETIM 5.0/6.0 Class-Description: Patch panel fibre optic



Article number	Article designation	Pieces / PU
Splice Box Compact		
CE9147	Splice Box Compact	1

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Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Adapters refer to page 245
- GOF SIMPLEX Pigtail refer to page 243
- Accessories for splice boxes and wall-mounted rack refer to page 248

Mini wall-mounted rack

Product features

- Panel mounting
- Lockable
- Max. capacity of 8 splicing cartridges or 4 splicing cartridges and one distribution plate
- Accessories for Mini wall-mounted rack:
  - Distributor plate for 24 ST couplings
  - Distributor plate for 24 SC Simplex couplings
  - Distributor plate for 12 SC Duplex couplings
- Dimensions (W x H x D): 320 x 280 x 54 mm
- Colour: light grey (RAL 7035)

Technical data

ETIM

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001130
ETIM 5.0/6.0 Class-Description: Patch panel fibre optic

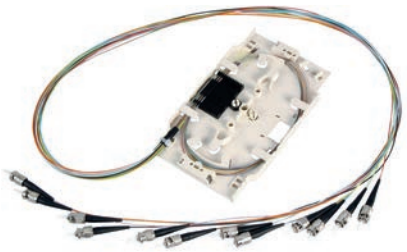
Article number	Article designation	Pieces / PU
Mini wall-mounted rack		
CE9150	Mini wall-mounted rack	1
Accessories for Mini wall-mounted rack		
CE9151	Distribution plate for 24 x ST-Couplers	1
CE9152	Distribution plate for 24 x SC-simplex-Couplers	1
CE9153	Distribution plate for 12 x SC-duplex-Couplers	1

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Adapters refer to page 245
- GOF SIMPLEX Pigtail refer to page 243
- Accessories for splice boxes and wall-mounted rack refer to page 248

Accessories for splice boxes and wall-mounted rack



Product features

- Splicing cassette for up to 2 splicing protection holders
- Cover for splicing cartridge
- 12-fold splicing protection holder
- Splicing protection sleeve for ANT splicing device
- Blind cap instead of E2000 coupling
- Blind cap instead of ST coupling
- Dummy cap instead of SC duplex coupling

Technical data

Classification ETIM 5/6
ETIM 5.0/6.0 Class-ID: EC001123
ETIM 5.0/6.0 Class-Description: Splice protection

Article number	Article designation	Pieces / PU
Accessories for splice boxes and wall-mounted rack		
CE9914	Splicing cassette for up to 2 splicing protection holders	1
CE9914D	Cover for splicing cartridge	1
CE9916	12-fold splicing protection holder	1
CE9913	Splicing protection sleeve for ANT splicing device	15
CE9917	Blind cap instead of E2000 coupling	10
CE9918	Blind cap instead of ST coupling	10
CE9919	Blind cap instead of SC duplex coupling	10

Photographs and graphics are not to scale and do not represent detailed images of the respective products.

Accessories

- GOF DUPLEX Patchcord refer to page 242
- GOF Adapters refer to page 245
- GOF SIMPLEX Pigtail refer to page 243
- Ty-Grip® FOL / FO Cable tie refer to main catalogue 2018/19

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The conformity of our products to the relevant European directives and compliance with the provisions contained therein shall be indicated by the CE marking.

Safety

Without exception, our products are tested for application safety in accordance with defined standards and our own regulations, which complement the standards. Relevant legal requirements and safety regulations are also observed. Provided due care and attention is paid, the possibility of product-specific danger to the user may thus reasonably be excluded. Where products are used carelessly or incorrectly, however, considerable danger to persons and the environment may arise. For this reason, our cables must only be processed and/or used responsibly by trained electricians or specialists. This catalogue contains general information for the application of each product. Independent of such information, the application standards DIN VDE 0298 and DIN VDE 0891 for cables will apply. Excerpts from these standards, as well as complementary selection and application tables, design and installation guidelines, are contained in the tables in the appendix to the current main catalogue. Our machines and installation tools are – where necessary – designed in accordance with the machine guidelines and display the CE identification mark. It must be noted, however, that our machines and installation tools must only be used by trained specialist personnel and for the purpose for which they were designed.

The safety of our products is closely associated with how they are used. A knowledge of and adherence to the respective international/national standards of use (e.g. DIN VDE 0100; 0298) are mandatory. There are particular risks if installed improperly. This applies to all our products/items:

Processing is only to be done by an authorised electrician! Otherwise, there is the risk of an electric shock or a fire ignited by electric current!

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